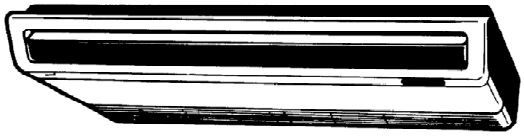
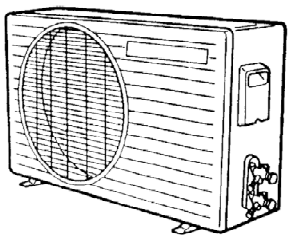
Order No. MAC0112088C0

Service Manual

Room Air Conditioner

CS-A12ATP5 CU-A12ATP5 / CS-A18ATP5 CU-A18ATPT5 / CS -A24ATP5 CU-A24ATPT5





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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

⚠ PRECAUTION OF LOW TEMPERATURE

In order to avoid frostbite, be assured of no refrigerant leakage during the installation or repairing of refrigeration circuit.

1. Functions

2. Product Specifications

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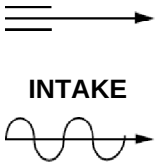
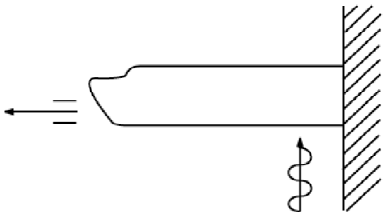
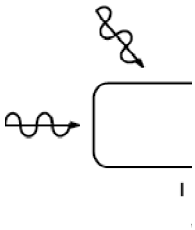
		Unit	CS-A12ATP5	CU-A12A
Cooling Capacity		kW BTU/h kcal/h	3.35; 3.35; 3.40 11,400; 11,400; 11,600 2,870; 2,870; 2,920	
Heating Capacity		kW BTU/h kcal/h	4.00; 4.00; 4.10 13,600; 13,600; 13,900 3,430; 3,430; 3,500	
Moisture Removal		l/h Pint/h	2.0 4.2	
Power Source		Phase V Cycle	Single 220; 230; 240 50	
Airflow Method		OUTLET  INTAKE	SIDE VIEW 	TOP VII 
Air Volume	Indoor Air (Lo)	m3/min (cfm)	8.9 (314)	—
	Indoor Air (Me)	m3/min (cfm)	9.6 (339)	—
	Indoor Air (Hi)	m3/min (cfm)	10.0 (350)	—

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			Unit	CS-A12ATP5	CU-A12A
Noise Level			dB (A)	Cooling: High 45; 46; 46 Low 41; 42; 42 Heating: High 45; 46; 46 Low 41; 42; 42	Cooling: High Heating: High
Power Noise Level			dB (A)	Cooling: High 59 Heating: High 59	Cooling: Hi Heating: Hi
Electrical Data	Input		kW	Cooling: 1.27; 1.28; 1.30 Heating: 1.27; 1.32; 1.35	
	Running Current		A	Cooling: 6.0; 5.9; 5.8 Heating: 6.0; 6.1; 6.1	
	EER		W/W (BTU/hW)	Cooling: 2.64 (9.0); 2.62 (8.9); 2.62 (8.9	
	COP		W/W (BTU/hW)	Heating: 3.15 (10.7); 3.03 (10.3); 3.04 (10	
	Starting Current		A	25	
Piping Connection Port (Flare piping)			inch inch	G ; Half Union 1/2” L ; Half Union 1/4”	G ; 3-way va L ; 2-way val
Pipe Size (Flare piping)			inch inch	G (gas side) ; 1/2” L (liquid side) ; 1/4”	G (gas side L (liquid side
Drain Hose	Inner diameter		mm	20	—
	Length		m	0.6	—
Power Cord Length Number of core-wire			m	2.3 3 (1.0 mm2)	— —
Dimensions		Height	inch (mm)	6 - 1/2 (165)	19 - 29/32
		Width	inch (mm)	43 - 5/16 (1,100)	30 - 23/32
		Depth	inch (mm)	25 - 19/32 (650)	9 - 21/32
Net Weight			lb (kg)	62 (28)	88 (40
Compressor		Type		—	Rotary (1 cy rolling pistc
	Motor	Type		—	Induction (2
	Rated	Output	W	—	1,100

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			Unit	CS-A12ATP5	CU-A12A
Air Circulation		Type		SIROCCO	Propeller
		Material		STYLAC 181	AES + Glass F
	Motor	Type		Induction (4-poles)	Induction (6
		Input	W	45.6	58.6
		Rated Output	W	20	20
	Fan Speed	Low	rpm	980	—
		Medium	rpm	1,055	—
		High	rpm	1,100	730
Heat Exchanger	Description			Evaporator	Conden
	Tube material			Copper	Coppe
	Fin material			Aluminium	Alumini
	Fin Type			Louver Fin	Corrugate
	Row / Stage			(Plate fin configuration, forced draft)	
				1 × 10	2 × 1
	FPI			21	16
	Size (W × H × L)		mm	900 × 254 × 22	706 × 482
Refrigerant Control Device				—	Capillary
Refrigeration Oil			(c.c)	—	SUNISO 4G ATMOS M6
Refrigerant (R-22)			g (oz.)	—	1,090 (3
Thermostat				Electronic Control	—
Protection Device				—	Overload Pr
Capillary Tube	Length		mm	—	Cooling; 625, 720
	Flow Rate		l/min	—	Cooling; 13.5, 11.0
	Inner Diameter		mm	—	Cooling; 1.6, H
Air Filter	Material			P.P.	—
	Style			Honeycomb	
Capacity Control				Capillary Tube	
Compressor Capacitor			μF, VAC	—	30 μF, 37
Fan Motor Capacitor			μF, VAC	1.2 μF, 450VAC	1.2 μF, 4(

- Specifications are subject to change without notice for further improvement.

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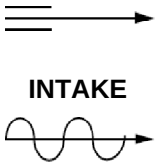
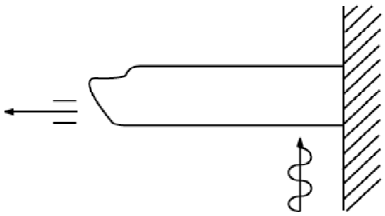
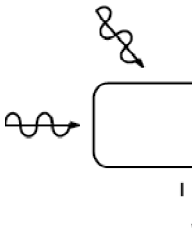
		Unit	CS-A18ATP5	CU-A18AT
Cooling Capacity		kW BTU/h kcal/h	5.05; 5.05; 5.10 17,200; 17,200; 17,400 4,340; 4,340; 4,390	
Heating Capacity		kW BTU/h kcal/h	5.35; 5.35; 5.45 18,200; 18,200; 18,600 4,600; 4,600; 4,690	
Moisture Removal		l/h Pint/h	2.8 5.9	
Power Source		Phase V Cycle	Single 220; 230; 240 50	
Airflow Method		OUTLET  INTAKE	SIDE VIEW 	TOP VII 
Air Volume	Indoor Air (Lo)	m3/min (cfm)	10.4 (354)	—
	Indoor Air (Me)	m3/min (cfm)	10.7 (379)	—
	Indoor Air (Hi)	m3/min (cfm)	11.5 (400)	—

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			Unit	CS-A18ATP5	CU-A18AT
Noise Level			dB (A)	Cooling: High 50; 51; 51 Low 44; 46; 46 Heating: High 51; 52; 52 Low 45; 46; 46	Cooling: High Heating: High
Power Noise Level			dB (A)	Cooling: High 64 Heating: High 65	Cooling: Hi Heating: Hi
Electrical Data	Input		kW	Cooling: 2.08; 2.13; 2.19 Heating: 1.90; 1.98; 2.04	
	Running Current		A	Cooling: 10.3; 10.5; 10.7 Heating: 9.4; 9.7; 9.9	
	EER		W/W (BTU/hW)	Cooling: 2.43 (8.3); 2.37 (8.1); 2.33 (7.9	
	COP		W/W (BTU/hW)	Heating: 2.82 (9.6); 2.70 (9.2); 2.67 (9.1	
	Starting Current		A	47	
Piping Connection Port (Flare piping)			inch inch	G ; Half Union 1/2” L ; Half Union 1/4”	G ; 3-way va L ; 2-way val
Pipe Size (Flare piping)			inch inch	G (gas side) ; 1/2” L (liquid side) ; 1/4”	G (gas side L (liquid side
Drain	Inner diameter		mm	20	—
Hose	Length		m	0.6	—
Power Cord Length Number of core-wire			m	2.3 3 (1.5 mm2)	— —
Dimensions		Height	inch (mm)	6 - 1/2 (165)	26 - 31/32
		Width	inch (mm)	43 - 5/16 (1,100)	31 - 1/2 (
		Depth	inch (mm)	25 - 19/32 (650)	11 - 13/16
Net Weight			lb (kg)	66 (30)	132 (6
Compressor		Type		—	Rotary (1 cy rolling pistc
	Motor	Type		—	Induction (2
	Rated	Output	W	—	1,700

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			Unit	CS-A18ATP5	CU-A18AT
Air Circulation	Type			SIROCCO	Propeller
	Material			STYLAC 181	CE10G15
	Motor	Type		Induction (4-poles)	Induction (4
		Input	W	66.0	136.8 (Hi
		Rated Output	W	40	65
	Fan Speed	Low	rpm	1,160	610
		Medium	rpm	1,250	—
		High	rpm	1,340	960
Heat Exchanger	Description			Evaporator	Conden
	Tube material			Copper	Coppe
	Fin material			Aluminium	Alumini
	Fin Type			Louver Fin	Corrugate
	Row / Stage			(Plate fin configuration, forced draft)	
				2 × 10	2 × 2(
	FPI			20	14
	Size (W × H × L)		mm	900 × 254 × 44	769 × 66(
Refrigerant Control Device				—	Capillary
Refrigeration Oil			(c.c)	—	SUNISO 4G ATMOS M6
Refrigerant (R-22)			g (oz.)	—	1,550 (5
Thermostat				Electronic Control	—
Protection Device				—	Inner Prot
Capillary Tube	Length		mm	—	1,17(
	Flow Rate		l/min	—	21.1
	Inner Diameter		mm	—	2.4
Air Filter	Material			P.P.	—
	Style			Honeycomb	
Capacity Control				Capillary Tube	
Compressor Capacitor			μF, VAC	—	35 μF, 37
Fan Motor Capacitor			μF, VAC	1.2 μF, 450VAC	3.5 μF, 4(

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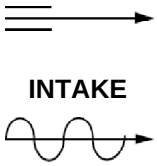
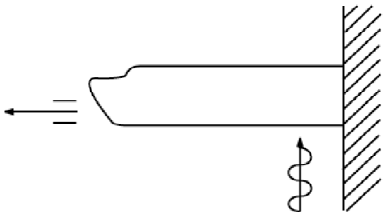
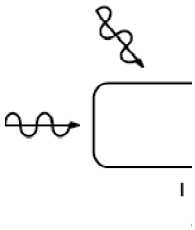
		Unit	CS-A24ATP5	CU-A24AT
Cooling Capacity		kW BTU/h kcal/h	6.00; 6.05; 6.10 20,400; 20,600; 20,800 5,140; 5,190; 5,240	
Heating Capacity		kW BTU/h kcal/h	6.00; 6.05; 6.20 20,400; 20,600; 21,100 5,140; 5,190; 5,310	
Moisture Removal		l/h Pint/h	3.4 7.2	
Power Source		Phase V Cycle	Single 220; 230; 240 50	
Airflow Method		OUTLET  INTAKE	SIDE VIEW 	TOP VII 
Air Volume	Indoor Air (Lo)	m3/min (cfm)	10.4 (370)	—
	Indoor Air (Me)	m3/min (cfm)	11.2 (395)	—
	Indoor Air (Hi)	m3/min (cfm)	12.0 (420)	—

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			Unit	CS-A24ATP5	CU-A24AT
Noise Level			dB (A)	Cooling: High 51; 52; 52 Low 45; 47; 47 Heating: High 51; 52; 52 Low 45; 47; 47	Cooling: High Heating: High
Power Noise Level			dB (A)	Cooling: High 65 Heating: High 65	Cooling: Hi Heating: Hi
Electrical Data	Input		kW	Cooling: 2.75; 2.80; 2.89 Heating: 2.40; 2.59; 2.62	
	Running Current		A	Cooling: 13.3; 13.4; 13.6 Heating: 11.7; 12.3; 12.5	
	EER		W/W (BTU/hW)	Cooling: 2.18 (7.4); 2.16 (7.4); 2.11 (7.2	
	COP		W/W (BTU/hW)	Heating: 2.50 (8.5); 2.33 (8.0); 2.37 (8.1	
	Starting Current		A	59	
Piping Connection Port (Flare piping)			inch inch	G ; Half Union 5/8” L ; Half Union 1/4”	G ; 3-way va L ; 2-way val
Pipe Size (Flare piping)			inch inch	G (gas side) ; 5/8” L (liquid side) ; 1/4”	G (gas side L (liquid side
Drain	Inner diameter		mm	20	—
Hose	Length		m	0.6	—
Power Cord Length Number of core-wire			m	2.3 3 (2.5 mm2)	— —
Dimensions		Height	inch (mm)	6 - 1/2 (165)	26 - 31/32
		Width	inch (mm)	43 - 5/16 (1,100)	31 - 1/2 (
		Depth	inch (mm)	25 - 19/32 (650)	11 - 13/16
Net Weight			lb (kg)	66 (30)	137 (6
Compressor		Type		—	Rotary (1 cy rolling pistc
	Motor	Type		—	Induction (2
	Rated	Output	W	—	2,200

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			Unit	CS-A24ATP5	CU-A24AT
Air Circulation	Type			SIROCCO	Propeller
	Material			STYLAC 181	CE10G15
	Motor	Type		Induction (4-poles)	Induction (4
		Input	W	66.0	141.7 (Hi
		Rated Output	W	40	80
	Fan Speed	Low	rpm	1,160	685
		Medium	rpm	1,250	—
		High	rpm	1,340	1,053
Heat Exchanger	Description			Evaporator	Conden
	Tube material			Copper	Coppe
	Fin material			Aluminium	Alumini
	Fin Type			Louver Fin	Corrugate
	Row / Stage			(Plate fin configuration, forced draft)	
				2 × 10	2 × 2(
	FPI			20	14
	Size (W × H × L)		mm	900 × 254 × 44	769 × 66(
Refrigerant Control Device				—	Capillary
Refrigeration Oil			(c.c)	—	SUNISO 4G ATMOS M6
Refrigerant (R-22)			g (oz.)	—	1,900 (6
Thermostat				Electronic Control	—
Protection Device				—	Inner Prot
Capillary Tube	Length		mm	—	1,170
	Flow Rate		l/min	—	21.1
	Inner Diameter		mm	—	2.4
Air Filter	Material			P.P.	—
	Style			Honeycomb	
Capacity Control				Capillary Tube	
Compressor Capacitor			μF, VAC	—	45 μF, 37
Fan Motor Capacitor			μF, VAC	1.2 μF, 450VAC	3.5 μF, 4(

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3. Dimensions

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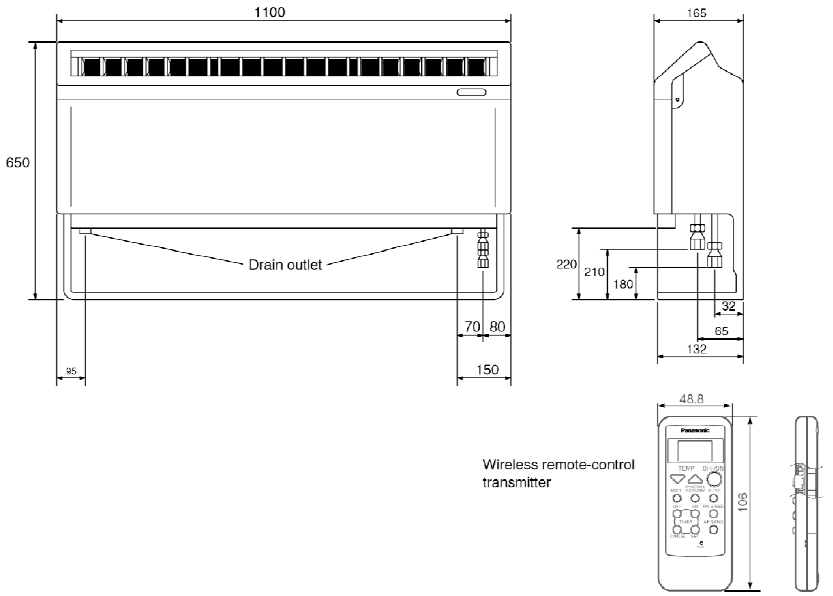
CS-A12ATP / CS-A18ATP / CS-A24ATP



Relative Position Between The Indoor Unit The Installation Parts

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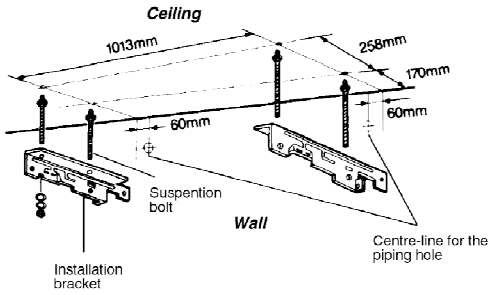
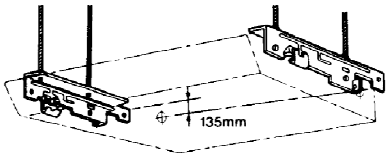


Relative position between the hole and the bracket



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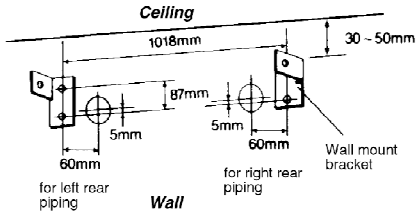
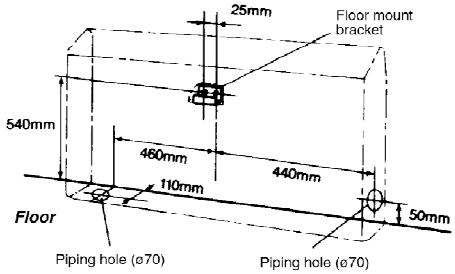


<Installation on the Floor>



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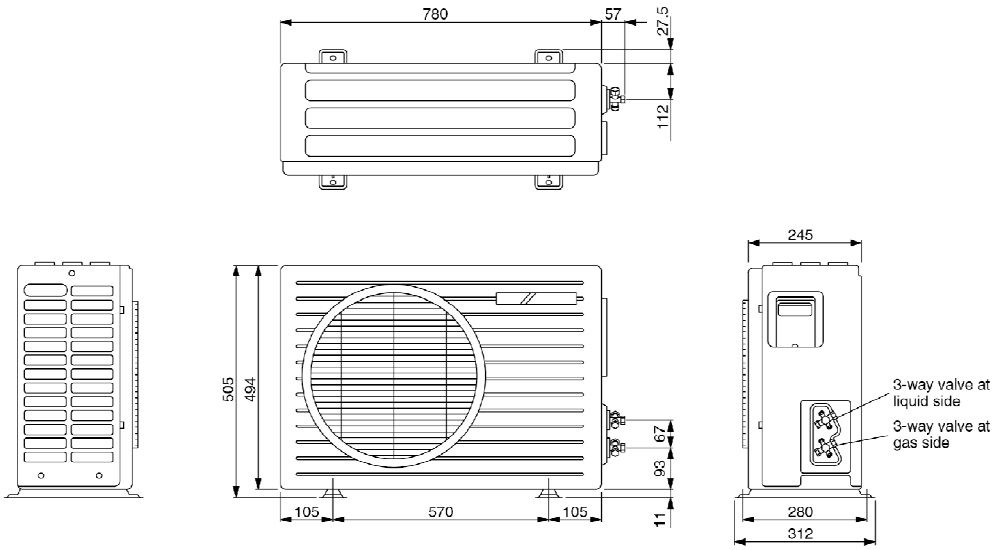
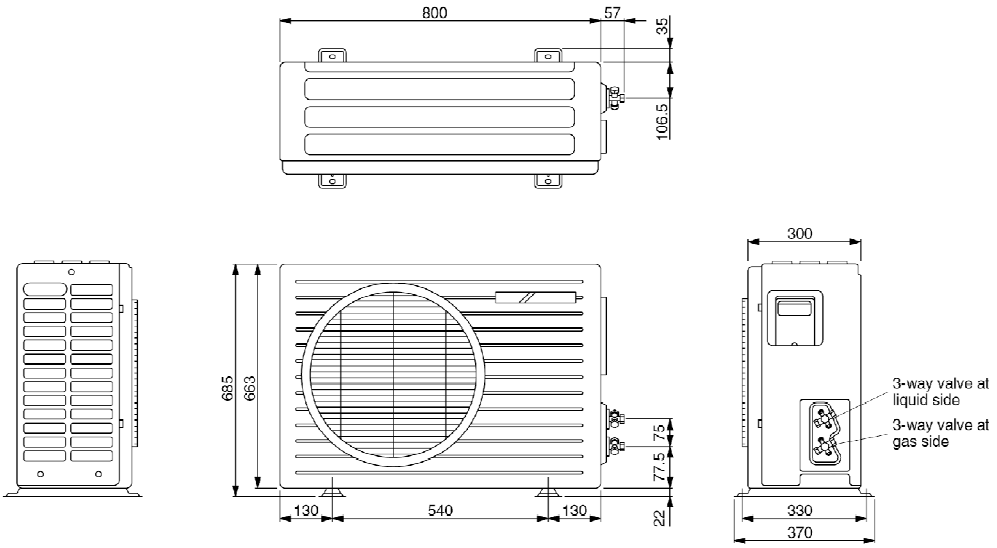
CU-A12ATP



CU-A18ATPT
CU-A24ATPT



4. Refrigeration Cycle Diagram

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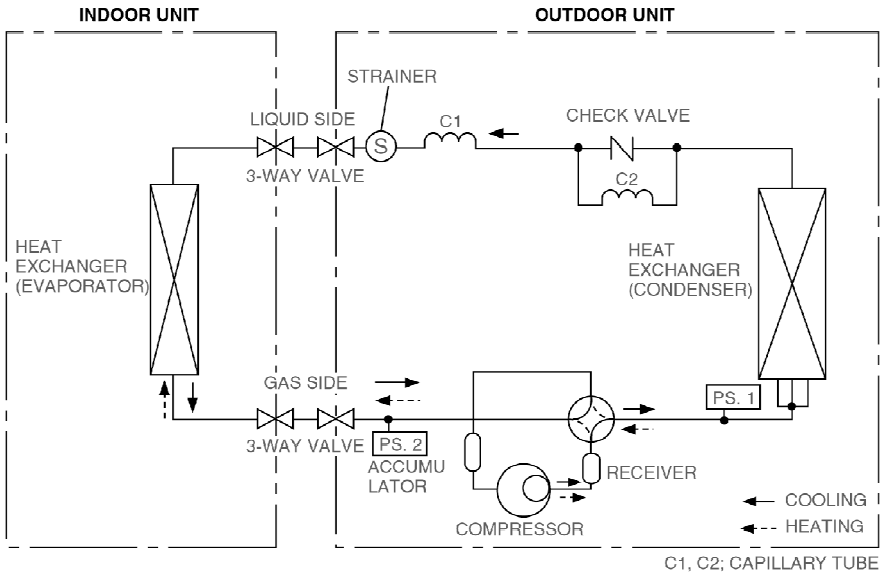
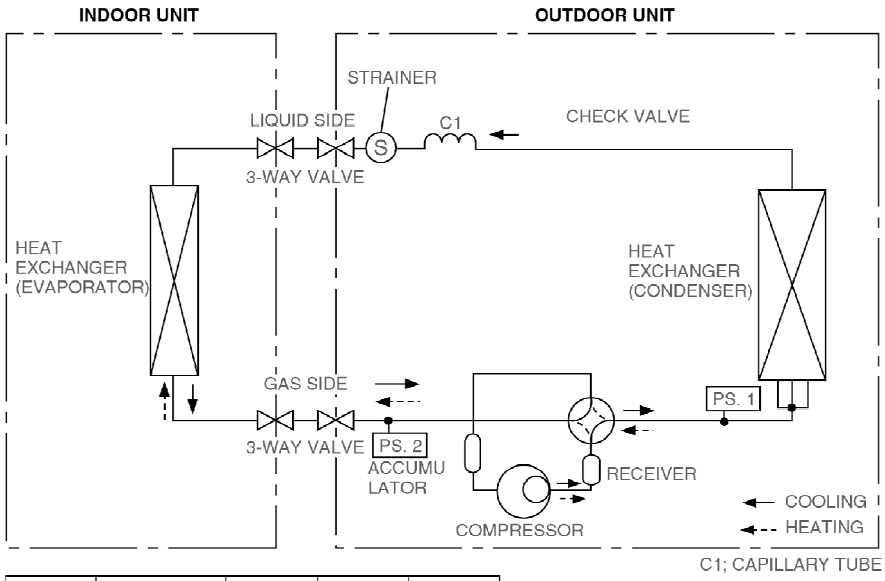
CS-A12ATP



CS-A18ATPT / CS-A24ATPT



Model	Pipe size		Max. Piping Length (m)	Max. Elevation (m)	Rated Length (m)
	GAS	LIQUID			
A12ATP	1/2"	1/4"	10	5	7.5
A18ATP	1/2"	1/4"	10	8	7.5
A24ATP	5/8"	1/4"	10	8	7.5

5. Block Diagram

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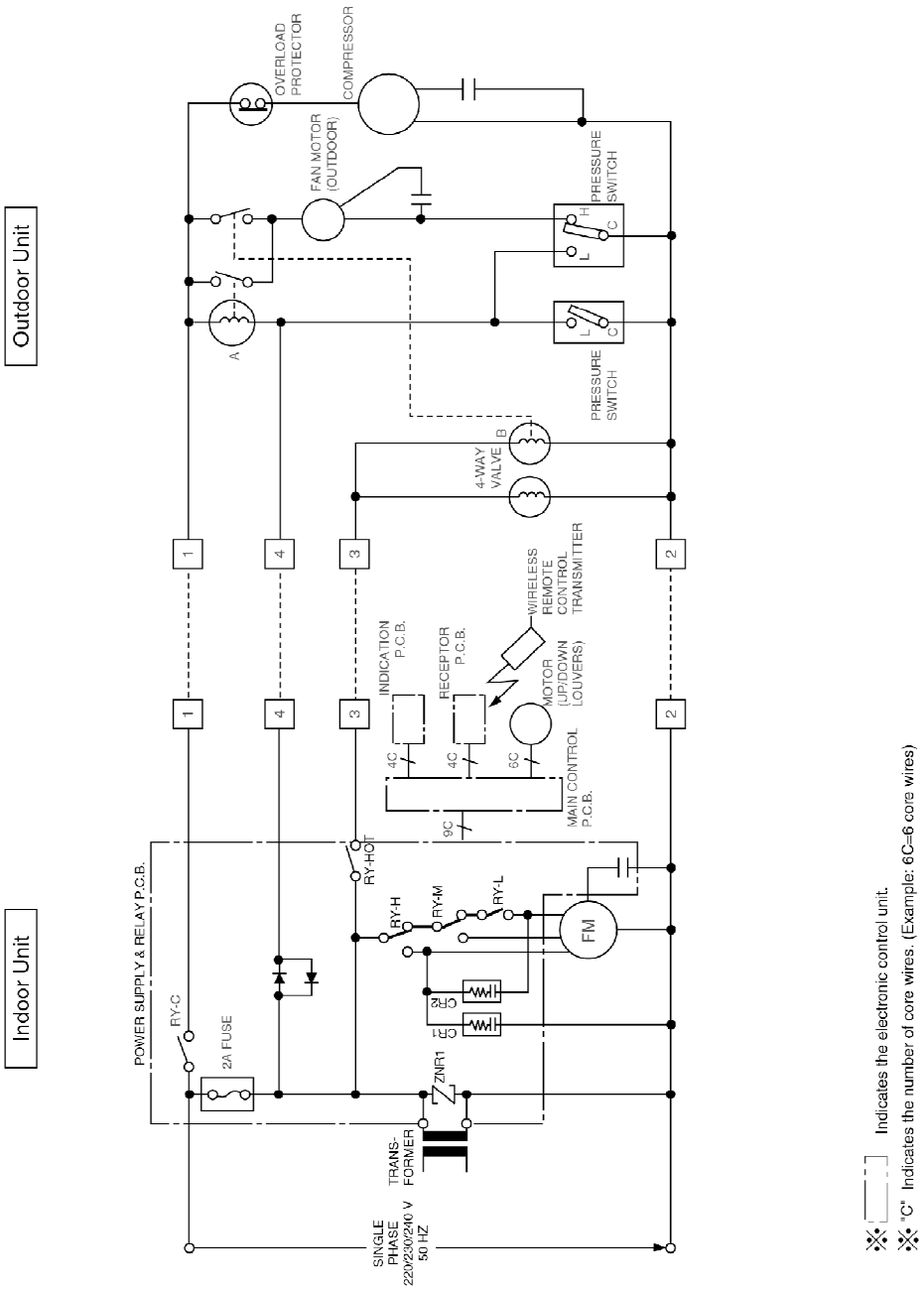
CS-A12ATP / CU-A12ATP



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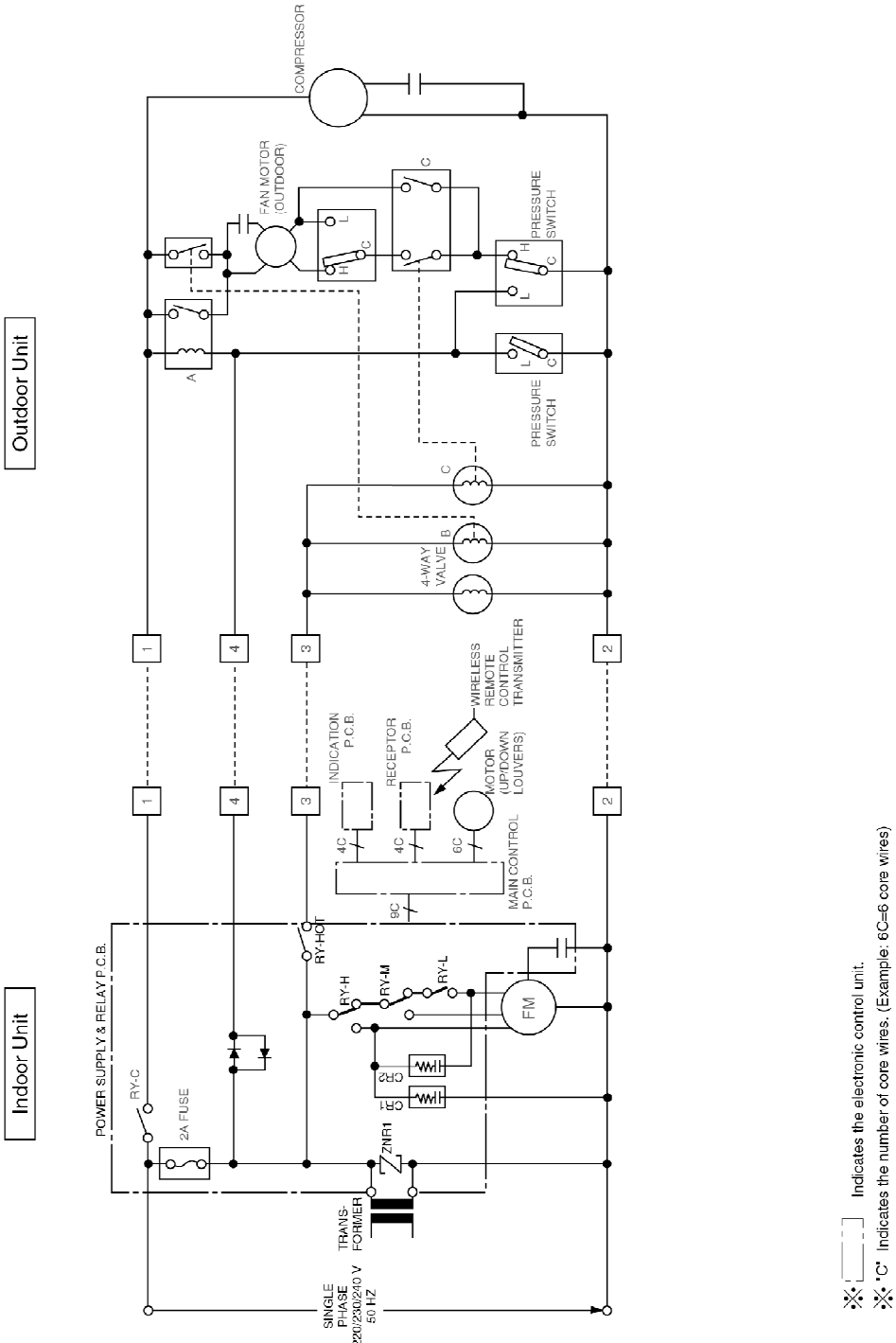
CS-A18ATP / CU-A18ATPT
CS-A24ATP / CU-A24ATPT



6. Wiring Diagram

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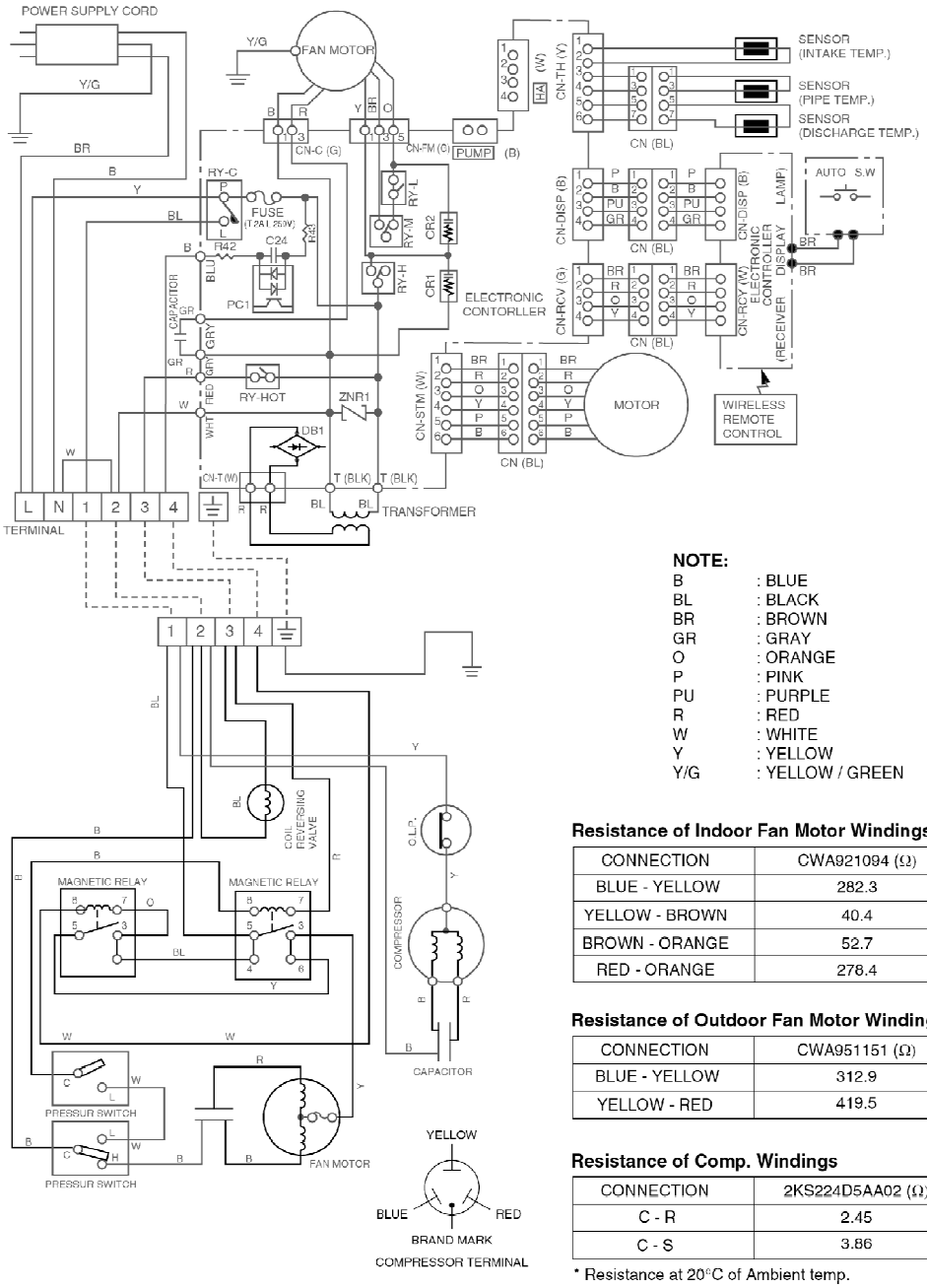
CS-A12ATP / CU-A12ATP



NOTE:

B	: BLUE
BL	: BLACK
BR	: BROWN
GR	: GRAY
O	: ORANGE
P	: PINK
PU	: PURPLE
R	: RED
W	: WHITE
Y	: YELLOW
Y/G	: YELLOW / GREEN

Resistance of Indoor Fan Motor Windings

CONNECTION	CWA921094 (Ω)
BLUE - YELLOW	282.3
YELLOW - BROWN	40.4
BROWN - ORANGE	52.7
RED - ORANGE	278.4

Resistance of Outdoor Fan Motor Windings

CONNECTION	CWA951151 (Ω)
BLUE - YELLOW	312.9
YELLOW - RED	419.5

Resistance of Comp. Windings

CONNECTION	2KS224D5AA02 (Ω)
C - R	2.45
C - S	3.86

* Resistance at 20°C of Ambient temp.

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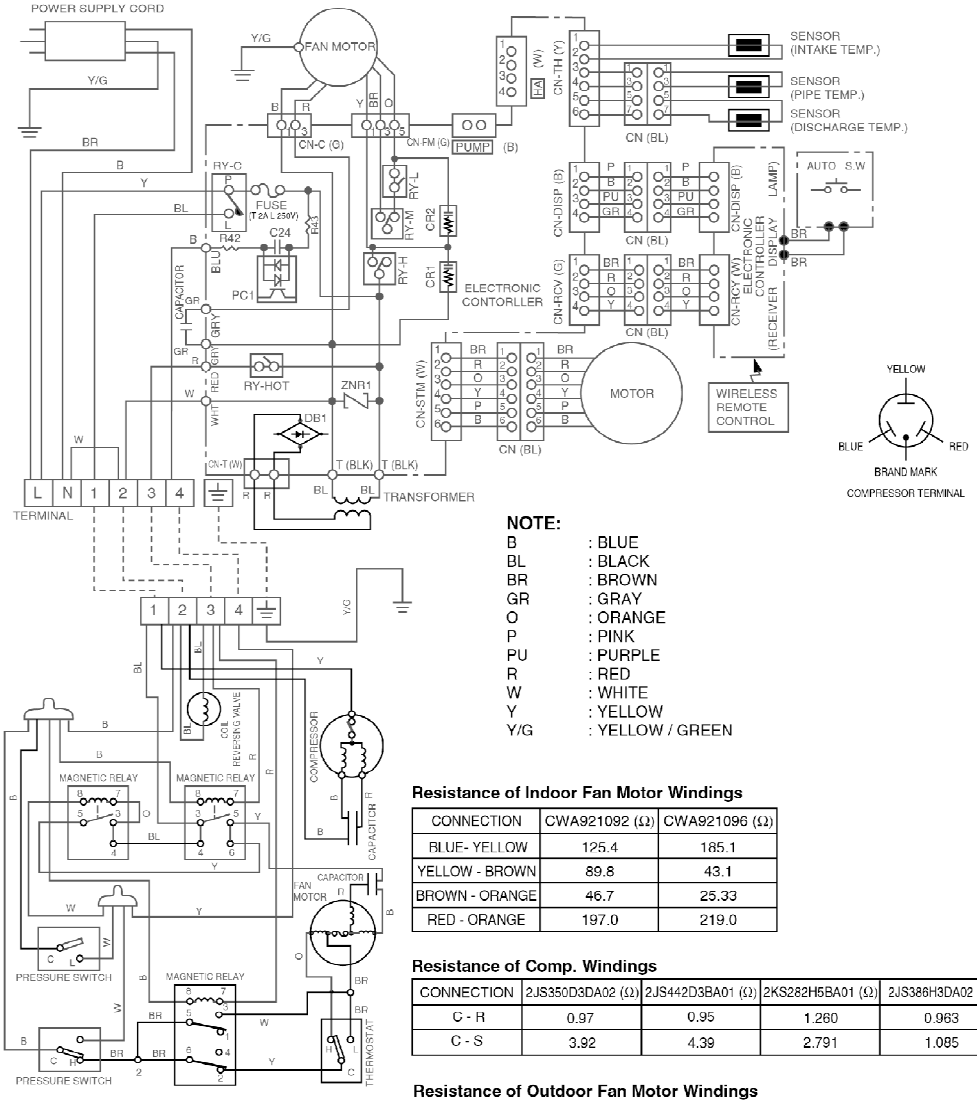
CS-A18ATP / CU-A18ATPT
CS-A24ATP / CU-A24ATPT



NOTE:

B	: BLUE
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PU	: PURPLE
R	: RED
W	: WHITE
Y	: YELLOW
Y/G	: YELLOW / GREEN

Resistance of Indoor Fan Motor Windings

CONNECTION	CWA921092 (Ω)	CWA921096 (Ω)
BLUE- YELLOW	125.4	185.1
YELLOW - BROWN	89.8	43.1
BROWN - ORANGE	46.7	25.33
RED - ORANGE	197.0	219.0

Resistance of Comp. Windings

CONNECTION	2JS350D3DA02 (Ω)	2JS442D3BA01 (Ω)	2KS282H5BA01 (Ω)	2JS386H3DA02 (Ω)
C - R	0.97	0.95	1.260	0.963
C - S	3.92	4.39	2.791	1.085

Resistance of Outdoor Fan Motor Windings

CONNECTION	CWA921095 (Ω)	CWA951153 (Ω)	CWA921093 (Ω)	CWA951154 (Ω)
BLUE- BROWN	83.4	165.6	62.5	128.7
BROWN - ORANGE	67.3	64.6	60.2	55.6
RED - BROWN	66.5	145.1	69.0	119.6

* Resistance at 20°C of Ambient temp.

7. Operation Details

7.1. Cooling Mode Operation

When selecting the Cooling (COOL) Mode Operation, the unit will operate according to the setting by the Remote Control and the operation is as the following.

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Time Delay Safety Control

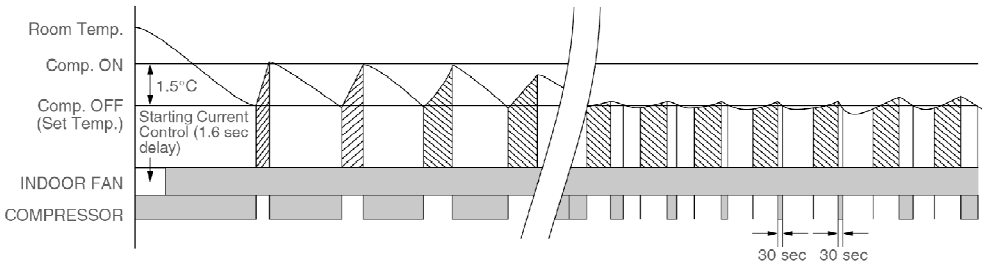
3 min. --- The Compressor is ceased for 3 minutes to balance the pressure in the refrigeration cycle.
(Protection of compressor)

Automatic Restarting Control

7 min. --- The unit will automatically operate in 7 minutes even if the room temperature is not reached.
(Protection of raising the humidity)

Compressor Forced Operation Control

30 sec. --- The compressor is switched ON at once, it is to be operated for 30 seconds.
(Protection of compressor)



7.2. Soft Dry Mode Operation

When selecting the Soft Dry (DRY) Mode Operation, the operation will be cooling until the Room Temperature reaches the Set Temp. on the remote control, and then Soft Dry will activate.

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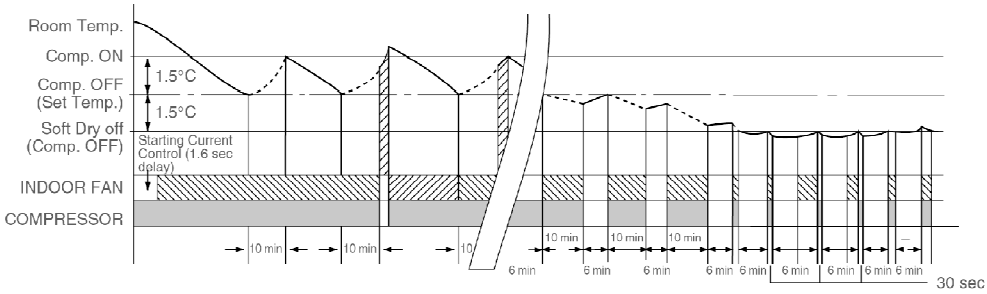
(During Soft Dry operation, the fan of the indoor unit will operate at Low fan speed and stop at 4-second intervals, and operation will be switched on and off for up to 10 minutes on and 6 minutes off.)



7.3. Detail of Sleep Mode

Sleep Mode operates to match your sleeping condition.

1. At Cooling or Soft Dry operation

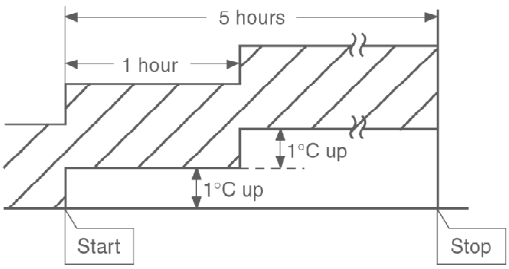
When you set the Sleep Mode (SLEEP), the following movement will start to avoid overcooling.

- **The fan speed is automatically set to low.**
- **The setting temperature will be rise by 1°C at the start of operation and by 1°C one hour later.**
- **The Automatic Restarting Control is changed from 7 minutes to 5 minutes.**
- **The operation will stop after 5 hours.**

2. At Heating operation

When you set the Sleep Mode (SLEEP), the following movement will start to avoid overheating.

- **The fan speed is automatically set to low.**
- **The setting temperature will dropped by 2°C at the start of operation and by 3°C one hour later.**
- **The operation will stop after 5 hours.**



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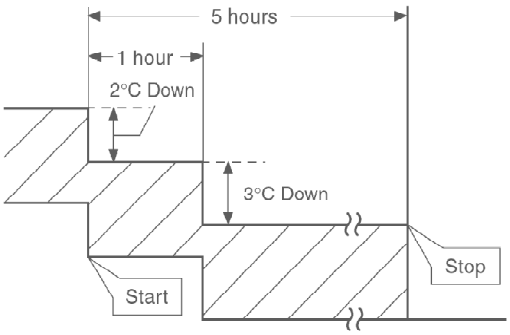

7.4. Heating Mode Operation

When selecting the Heating (HEAT) Mode Operation, the unit will operate according to the setting by the Remote Control and the operation is as the following.

(1) Room temperature can be set in 1°C steps in the range of 16 to 30°C. Relationship between the remote control temperature adjustment knob and operation is shown in the diagram below.

(2) Taking the difference between the room temperature distribution and intake air temperature, heating ON temperature is set to 3°C higher than the remote control setting.

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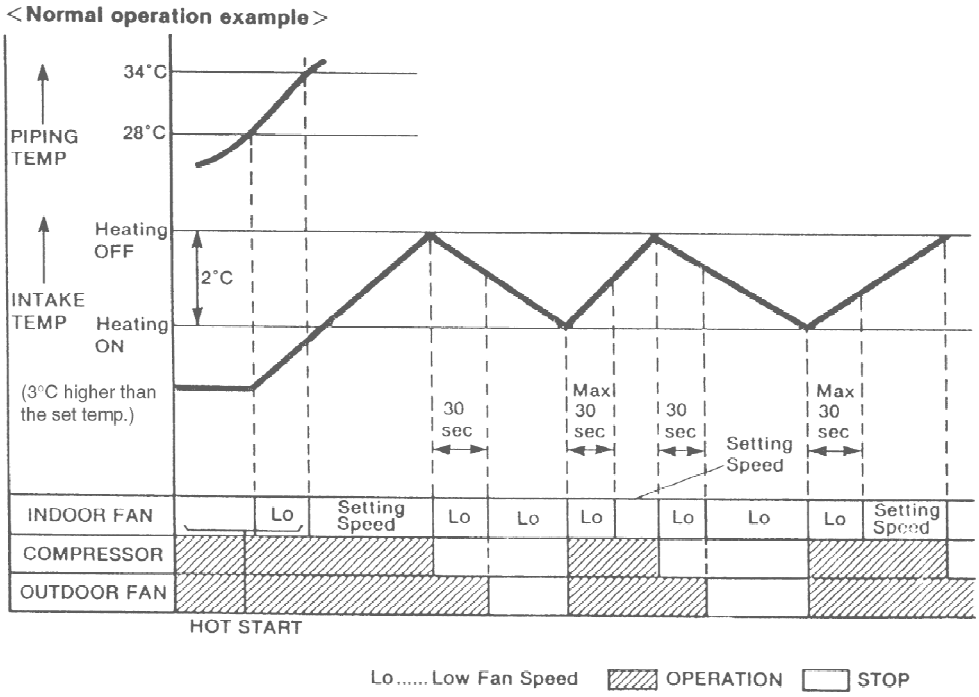
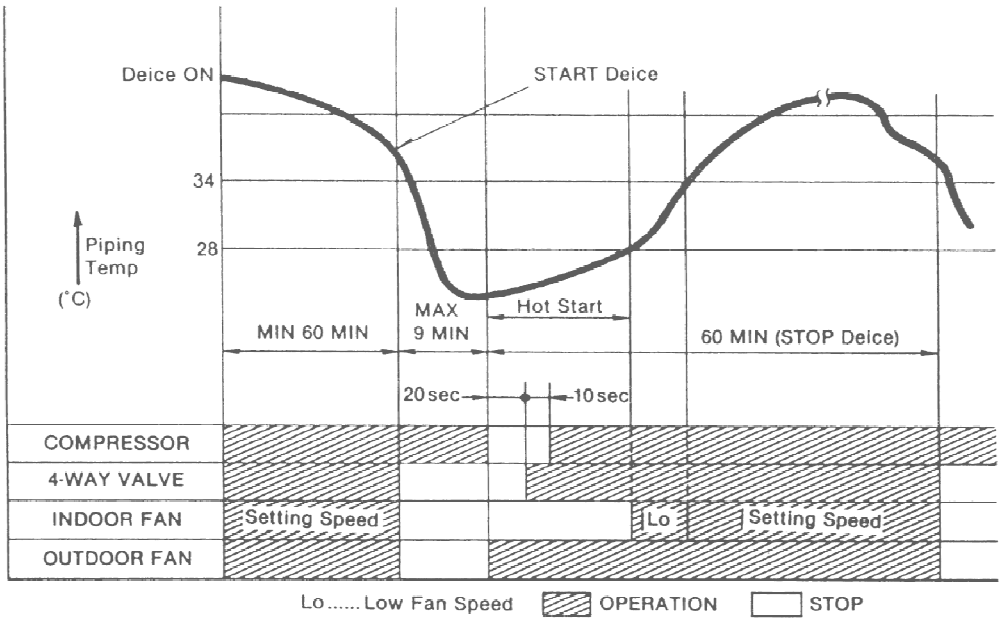


7.5. Deice control

- Deicing operation is controlled by sensing the indoor piping temperature and timer.

- Deicing starts when 60 minutes after start of heating or deice ends and if the indoor piping temperature is 46° (°C) or lower.

- Deicing ends by function of the pressure switch or after 9 minutes of deice operation.



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7.6. Airflow direction control

1. Manual operation

When the airflow direction adjustment button of the remote control is pressed, the louver moves up/down in the movable range shown in the diagram at right, and can be stopped at the required position.

Only the up/down louvers are adjustable from the remote control.

2. Automatic airflow direction

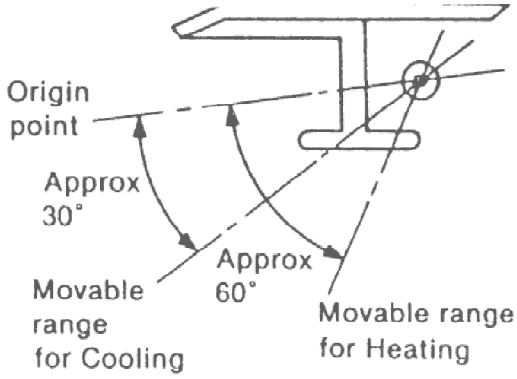
A. For cooling and soft dry

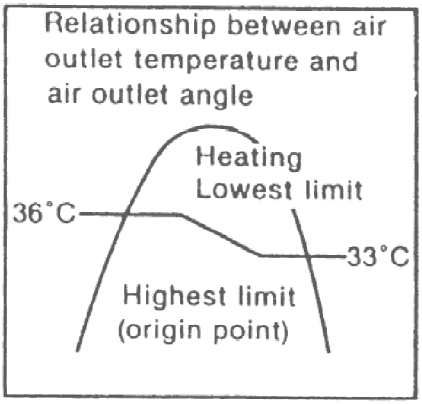
The up/down louver swings within the movable range.

B. For heating

As shown in the diagram at left, the blow out angle changes according to the blow out temperature.

*** Angle of the left/right louver is manually adjusted.**





7.7. Automatic operation

When AUTO (automatic operation) is set with the "operation mode selector" on the remote control, the indoor fan runs at Low speed for 20sec., the air conditioner unit senses the room temperature then automatically selects the operation mode and temperature setting.

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	Operation mode	Setting Temp (standard)
Intake Temp. (°C) ↑ 25 / 21	Cooling	27
	Soft Dry	24
	Heating	22

1. Relationship between room temperature at start and operation mode:

* **Operation lamp flashes while fan is running for the first 20sec., then lights.**
* **At start of operation, if the room temperature is 16°C or lower, heating operation (hot start) starts immediately.**
* **Once the operation mode is determined by automatic operation, that operation mode does not change unless the air conditioner is stopped once and restarted or by changing to a different mode using the operation mode select button.**

2. The 3 temperature settings listed below can be selected for

* **High : +2 degrees up**
* **Standard : +0**
* **Low : -2 degrees down**

8. Operating Instructions

9. Installation Instructions

Required tools for Installation Works			
1. Philips screw driver	5. Spanner	9. Gas leak detector	13. Multimeter
2. Level gauge	6. Pipe cutter	10. Measuring tape	14. Torque wrench 18 N.m (1.8 kgf.m) 55 N.m (5.5 kgf.m) 65 N.m (6.5 kgf.m)
3. Electric drill, hole core drill (ø70 mm)	7. Reamer	11. Thermometer	15. Vacuum pump
4. Hexagonal wrench (4 mm)	8. Knife	12. Megameter	16. Gauge manifold set

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9.1. Safety Precautions

- Read the following “SAFETY PRECAUTIONS” carefully before installation.

- Electrical work must be installed by a licensed electrician. Be sure to use the correct rating of the power plug and main circuit for the model to be installed.

- The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below. Incorrect installation due to ignoring of the instruction will cause harm or damage, and the seriousness is classified by the following indications.

⚠ WARNING	This indication shows the possibility of causing death or serious injury.

⚠ CAUTION	This indication shows the possibility of causing injury or damage to prop

The items to be followed are classified by the symbols:

	Symbol with background white denotes item that is PROHIBITED from do

- Carry out test running to confirm that no abnormality occurs after the installation. Then, explain to user the operation, care and maintenance as stated in instructions. Please remind the customer to keep the operating instructions for future reference.

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⚠ WARNING

1. **Engage dealer or specialist for installation. If installation done by the user is defective, it will c water leakage, electrical shock or fire.**
2. **Install according to this installation instruction strictly. If installation is defective, it will cause leakage, electrical shock or fire.**
3. **Use the attached accessories parts and specified parts for installation. Otherwise, it will cause to fall, water leakage, fire or electrical shock.**
4. **Install at a strong and firm location which is able to withstand the set's weight. If the strength i enough or installation is not properly done, the set will drop and cause injury.**
5. **For electrical work, follow the local national wiring standard, regulation and this installation instruction. An independent circuit and single outlet must be used. If electrical circuit capacity enough or defect found in electrical work, it will cause electrical shock or fire.**
6. **Use the specified cable and connect tightly for indoor/outdoor connection. Connect tightly and the cable so that no external force will be acted on the terminal. If connection or fixing is not p will cause heat-up or fire at the connection. The outlet cable shall be fastened by the two clam indoor unit.**
7. **Wire routing must be properly arranged so that control board cover is fixed properly. If control cover is not fixed perfectly, it will cause heat-up at connection point of terminal, fire or electric**
8. **When carrying out piping connection, take care not to let air substances other than the specifi refrigerant go into refrigeration cycle. Otherwise, it will cause lower capacity, abnormal high p in the refrigeration cycle, explosion and injury.**
9. **Do not damage or use unspecified power supply cord. Otherwise, it will cause fire or electrical shock.**
10. **Do not modify the length of the power supply cord or use of the extension cord, and do not share the single outlet with other electrical appliances. Otherwise, it will cause fire or electrical shock.**

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⚠ CAUTION

1. **The equipment must be earthed. It may cause electrical shock if grounding is not perfect.**

2. **Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire.**

3. **Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, v enter the room and damage the furniture.**

ATTENTION

1. **Selection of the installation location.**
   Select a installation location which is rigid and strong enough to support or hold the unit, and location for easy maintenance.

2. **Power supply connection to the room air conditioner.**
   Connect the power supply cord of the room air conditioner to the mains using one of the follo method.
   Power supply point shall be the place where there is ease for access for the power disconnect case of emergency.
   In some countries, permanent connection of this room air conditioner to the power supply is p

   1. Power supply connection to the receptacle using a power plug. / Use an approved 15A/16A power plug with earth pin for (C12AT, A C18AT, A18AT) and 20A for (C24AT, A24AT) for the connection to the socket.
   2. Power supply connection to a circuit breaker for the permanent connection. Use an approved 16A circuit breaker for C12AT, A12AT A18AT and 20A for C24AT, A24AT the permanent connection. It must be a double pole switch with a minimum 3 mm contact gap.

3. **Do not release refrigerant.**
   Do not release refrigerant during piping work for installation, reinstallation and during repairin refrigeration parts. Take care of the liquid refrigerant, it may cause frostbite.

4. **Installation work.**
   It may need two people to carry out the installation work.

5. **Do not install this appliance in a laundry room or other location where water may drip from the etc.**

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Installation Parts Provided

Applicable piping kit
CZ-4F5, 10AN: C12AT/A12AT, C18AT, A18AT
CZ-52F5, 7, 10AN: C24AT/A24AT

SELECT THE BEST LOCATION

INDOOR UNIT

- **There should not be any heat source or steam near the unit.**
- **There should not be any obstacles blocking the air circulation.**
- **A place where air circulation in the room is good.**
- **A place where drainage can be easily done.**
- **A place where noise prevention is taken into consideration.**
- **Do not install the unit near the door way.**
- **Ensure the spaces indicated by arrows from the wall, ceiling, fence or other obstacles.**

OUTDOOR UNIT

- **If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.**
- **There should not be any animal or plant which could be affected by hot air discharged.**
- **Keep the spaces indicated by arrows from wall, ceiling, fence or other obstacles.**
- **Do not place any obstacles which may cause a short circuit of the discharged air.**
- **If piping length is over the common length, additional refrigerant should be added as shown in the table.**

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Model	Piping size		Max. Piping Length Ⓐ (m)	Max. Elevation Ⓑ (m)	Rated	
	Gas	Liquid			Length (m)	Elevation
C12AT/ A12AT	1/2”	1/4”	10	5	7.5	5
C18AT/ A18AT	1/2”	1/4”	10	8	7.5	5
C24AT/ A24AT	5/8”	1/4”	10	8	7.5	5

Installation parts you should purchase*

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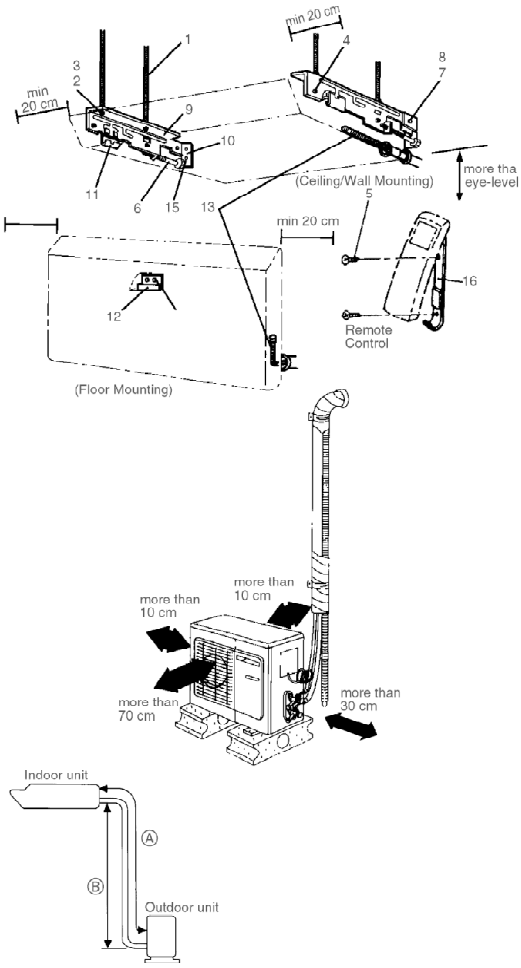

IMPORTANT
Begin the installation job from the "Indoor Unit" installation.

9.2. INDOOR UNIT

9.2.1. SELECT THE BEST LOCATION / (Refer to "Select the best location" section)

9.2.2. HOW TO FIX INSTALLATION PLATE

Installation on the ceiling

- **Measure and mark the position for the Suspension bolts and the piping hole.**
- **Drill the hole for anchor nut on the ceiling.**
- **Drill the Piping hole slightly tilted to the outdoor side with a Ø 70 hole-core drill.**
- **Insert the nuts and washers onto the suspension bolts for locking**

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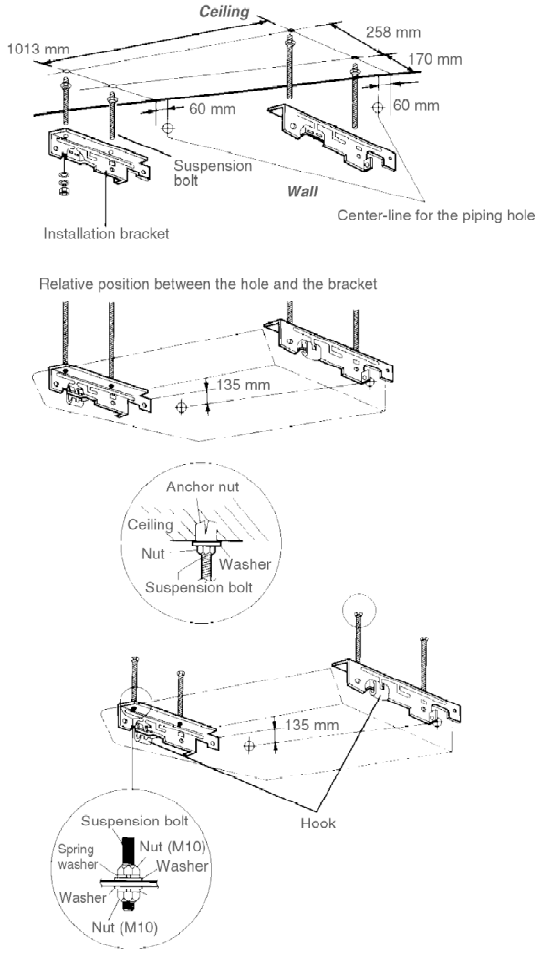
the Suspension bolts on the ceiling.

- Mount the suspension bolts to the anchor-nuts firmly.

- Secure the Installation brackets onto the Suspension bolts with Nuts, washers and spring washers. (Adjust a level roughly.)

- Place two Hooks to the Installation brackets properly.



Installation on the wall

- Measure and mark the position for the Wall mount brackets and the Piping hole.

- Drill the hole for anchor nut on the wall.

- Drill the Piping hole on the wall with a Ø 70 hole-core drill.

- Secure the Wall mount brackets onto the wall with four M10 × 50 bolts, washers and spring washers.

- Mount the suspension bolts to the anchor-nuts firmly.

- Secure the Installation brackets onto the Suspension bolts with

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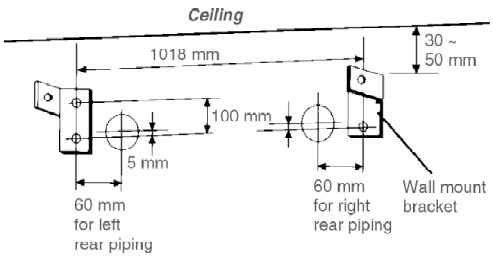
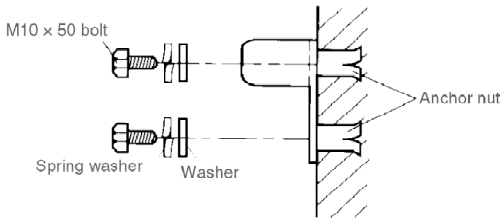
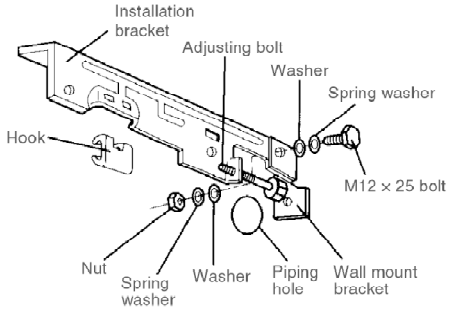
Nuts, washers and spring washers. (Adjust a level roughly.)

- Place two Hooks to the Installation brackets properly.







Installation on the floor

- Measure and mark the position for the floor brackets and the Piping hole.

- Drill the hole for the anchor nut.

- Drill the Piping hole with a Ø 70 hole-core drill (Either the left or the right).

- Secure the Floor mount brackets on the wall with two M4 screw.

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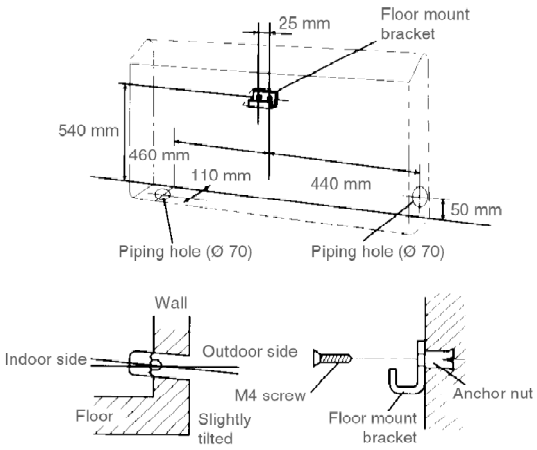


9.2.3. TO DRILL A HOLE IN THE WALL AND INSTALL A SLEEVE OF PIPING

1. Insert the piping sleeve to the hole.

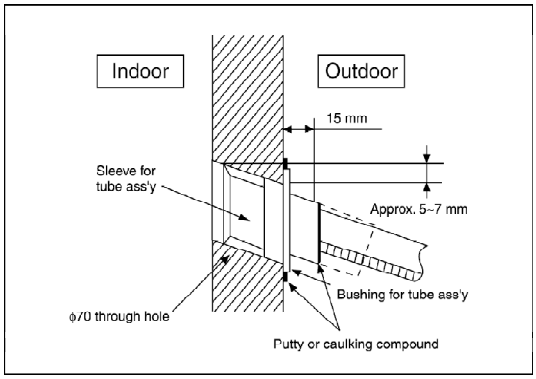
2. Fix the bushing to the sleeve.

3. Cut the sleeve until it extrudes about 15 mm from the wall.

Caution

When the wall is hollow, please be sure to use the sleeve for tube ass'y to prevent dangers caused by mice biting the connecting cable.

4. Finish by sealing the sleeve with putty or caulking compound at the final stage.



9.2.4. INDOOR UNIT INSTALLATION

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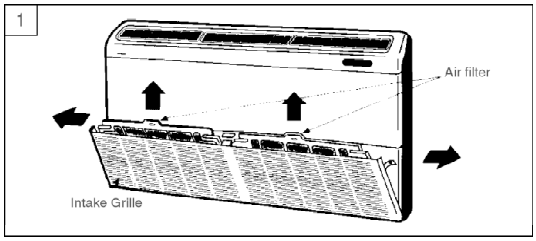
Indoor unit installation

1. Remove the Intake Grille.

- Pull the upper left and right side of the Intake Grille toward you, and it will stop at slightly tilted position.
- Slide the air filters out of the Intake Grille.
- Remove the screw at the top center of the Intake Grille and unhook the holder on the both left and right side on it.
- Pull the Intake Grille upward to cleat two bottom tabs from their slots on the chassis.



2a. For installation on the wall/ceiling.

(i) Install the Indoor unit onto the Installation brackets.

- Engage the upper flange of the hanging bracket on the unit with the Hooks and adjust a level by using a level gauge.
- Installed on the ceiling; adjust it by the Suspension bolt.
- Installed on the wall; adjust it by the Adjusting bolts.
- (Refer to the diagram below)

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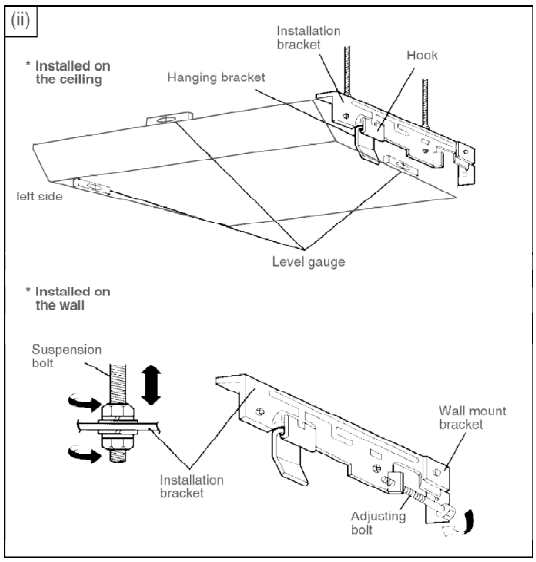
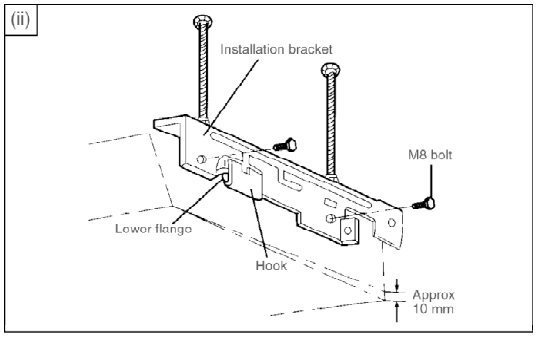


(ii) Secure the Indoor unit onto the Installation bracket with four M8 bolts with washer.

- Engage the lower flange of the hanging bracket on the unit with the Hooks.

- Secure the unit to the Installation bracket with four M8 bolts.

- (Refer to the diagram below)



2b. For installation on the floor.

(i) Install the Indoor unit on the floor.

- Remove the Knock-out portion with a minus screw driver.

- Engage the slot at the back center of the unit with the Floor mount bracket.
(Refer to diagram below)

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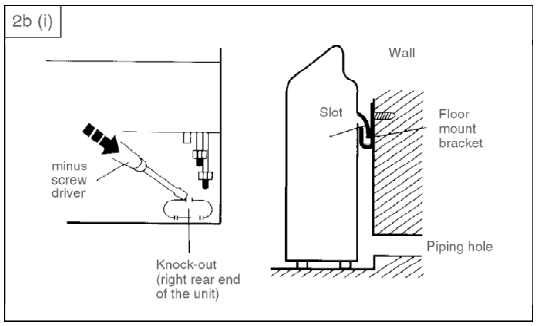

9.2.5. CONNECT THE CABLE TO THE INDOOR UNIT

1. Open the control box at the bottom end of the chassis and connect the cable through the hole.

- Ensure the color of wires of outdoor unit and the terminal Nos are the same to the indoor' unit respectively.

CS/CU-C12AT/C18AT/C24AT

Terminals on the indoor unit	1	2	⏚
Color of wires			
Terminals on the outdoor unit	1	2	⏚

CS/CU-A12AT/A18AT/A24AT

Terminals on the indoor unit	1	2	3	4	⏚
Color of wires					
Terminals on the outdoor unit	1	2	3	4	⏚

- Secure the cable onto the control board with the holder (clamper).

2. Attach the Side panels to the both left and right side of the chassis.

- Insert two tabs on the Side panel into two slots on the chassis, and secure it to the chassis with the screw.

3. Fix back the Intake Grille and the Filters.

9.2.6. PIPING AND DRAINAGE

Piping and Drainage

Connecting the pipings to the indoor unit.
(Refer to "CONNECTING THE PIPING" section)

1. For the Right Side Piping.

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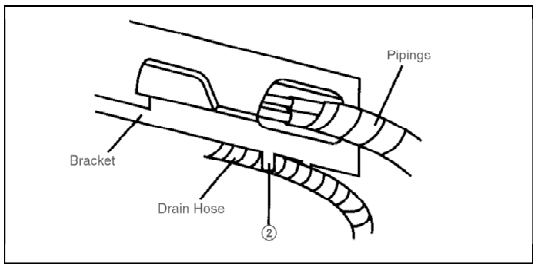
- Align the center of the pipings and sufficiently tighten the flare nut with fingers.
- Finally, tighten the flare nut with torque wrench until the wrench clicks.
  When tightening the flare nut with torque wrench, ensure the direction for tightening follows the arrow on the wrench.
- Connect the Drain Hose insulated to the drain outlet.

②Fix the Drain Hose at the holding portion of the Bracket.

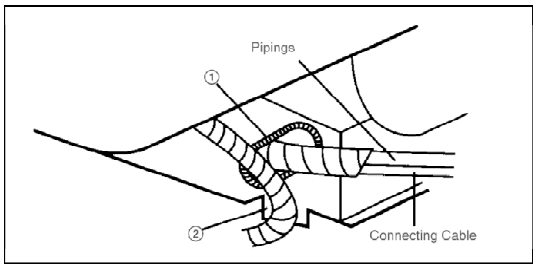


2. For the Left Side Piping.

①Attach the Edge Protector onto the edge of the Knock-out hole.

- Align the center of the pipings and sufficiently tighten the flare nut with fingers.
- Finally tighten the flare nut with torque wrench until the wrench clicks.
  When tightening the flare nut with torque wrench, ensure the direction for tightening follows the arrow on the wrench.
- Connect the Drain Hose insulated to the drain outlet.

②Fix the Drain Hose at the holding portion of the Chassis.



3. Cut off the Intake Grille and the Side Panel with a hacksaw according to the Mark-off Line on the inner surface of them for the Pipings and the Drain Hose.

4. For the Right Piping.

①Attach the Edge Protector onto the edge of the Knock-out hole.

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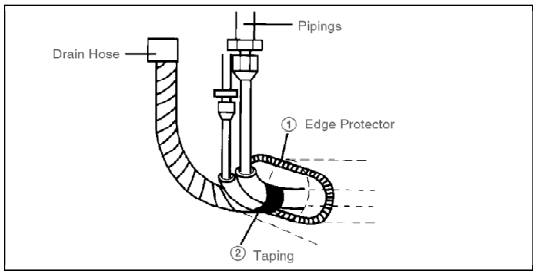
- Align the center of the pipings and sufficiently tighten the flare nut with fingers.
- Finally tighten the flare nut with torque wrench until the wrench clicks.
  When tightening the flare nut with torque wrench, ensure the direction for tightening follows the arrow on the wrench.
- Connect the Drain Hose insulated to the drain outlet.

②Tape the Drain Hose to the pipings to avoid coming off the drain-outlet.

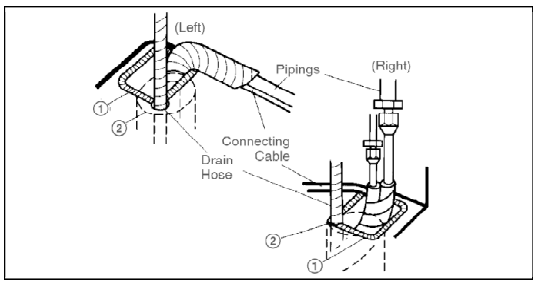


5. For the Left Bottom or Right Bottom Piping. / <For the Left Rear or Right Rear Piping of Ceiling or Wall Mounting>

①Attach the Edge Protector onto the edge of the Knock-out hole.

- Align the center of the pipings and sufficiently tighten the flare nut with fingers.
- Finally tighten the flare nut with torque wrench until the wrench clicks.
  When tightening the flare nut with torque wrench, ensure the direction for tightening follows the arrow on the wrench.
- Connect the Drain Hose insulated to the drain outlet.

②Fix the Drain Hose at the holding portion of the Knock-out hole.



9.3. OUTDOOR UNIT

9.3.1. SELECT THE BEST LOCATION / (Refer to “Select the best location”

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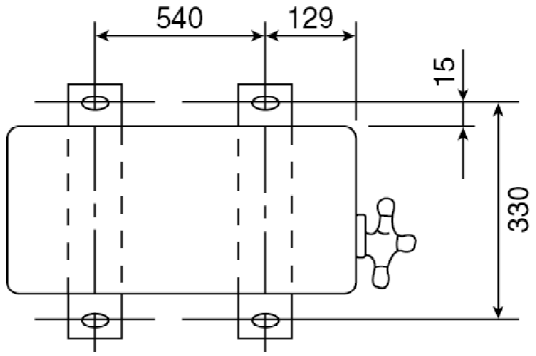
section)

9.3.2. INSTALL THE OUTDOOR UNIT

At the best location, start installation according to Indoor/Outdoor Unit Installation Diagram.

1. **Fix the unit on concrete or rigid frame firmly and horizontally by bolt nut. (ø10 mm).**
2. **When installing at roof, please consider strong wind. Please fasten the installation stand firmly with bolt or nails.**



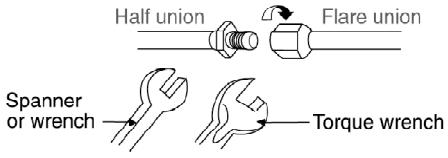
9.3.3. CONNECTING THE PIPING

Connecting The Piping To Indoor Unit

Please make flare after inserting flare nut (locate at joint portion of tube assembly) onto the copper pipe. (In case of using long piping)

Connect the piping

- **Align the center of piping and sufficiently tighten the flare nut with fingers.**
- **Further tighten the flare nut with torque wrench in specified torque as stated in the table.**



Pipe size	Torque
Liquid Side 1/4”	18 N.m
Gas Side 1/2”	55 N.m
Gas Side 5/8”	65 N.m

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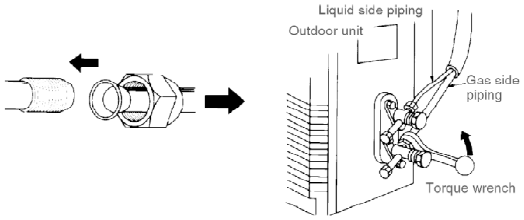
Connecting The Piping To Outdoor Unit

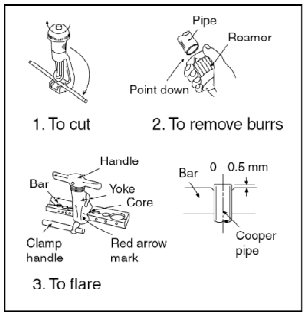
1. **Align the center of the pipings and sufficiently tighten the flare nut with fingers.**
2. **Finally, tighten the flare nut with torque wrench until the wrench clicks.**

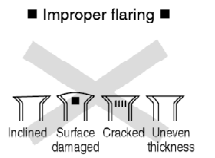
   - When tightening the flare nut with torque wrench, ensure the direction for tightening follows the arrow on the wrench.



CUTTING AND FLARING THE PIPING

1. **Please cut using pipe cutter and then remove the burrs.**
2. **Remove the burrs by using reamer. If burrs is not removed, gas leakage may be caused.**
   Turn the piping end down to avoid the metal powder entering the pipe.
3. **Please make flare after inserting the flare nut onto the copper pipes.**





When properly flared, the internal surface of the flare will evenly shine and be of even thickness. Since the flare part comes into contact with the connections, carefully check the flare finish.

9.3.4. (a) EVACUATION OF THE EQUIPMENT (FOR EUROPE & OCEANIA DESTINATION)

WHEN INSTALLING AN AIR CONDITIONER, BE SURE TO EVACUATE THE AIR INSIDE THE INDOOR UNIT AND PIPES in the following procedure.

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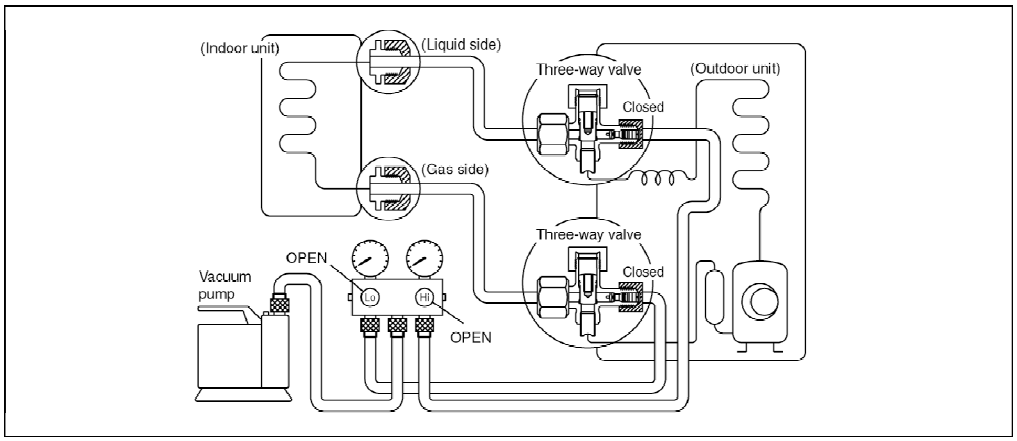

1. **Connect a charging hose with a push pin to the Low and High side of a charging set and the service port of the 3-way valve.**

   - Be sure to connect the end of the charging hose with the push pin to the service port.

2. **Connect the center hose of the charging set to a vacuum pump with check valve, or vacuum pump and vacuum pump adaptor.**
3. **Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to / -76 cmHg (-0.1 MPa). Then evacuate the air approximately ten minutes.**
4. **Close the Low side valve of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately five minutes.**
   Note: BE SURE TO FOLLOW THIS PROCEDURE IN ORDER TO AVOID REFRIGERANT GAS LEAKAGE.
5. **Disconnect the charging hose from the vacuum pump and from the service port of the 3-way valve.**
6. **Tighten the service port caps of the 3-way valve at torque of 18 N.m with a torque wrench.**
7. **Remove the valve caps of both of the 2-way valve and 3-way valve. Position both of the valves to “OPEN” using a hexagonal wrench (4 mm).**
8. **Mount valve caps onto the 2-way valve and the 3-way valve.**

   - Be sure to check for gas leakage.

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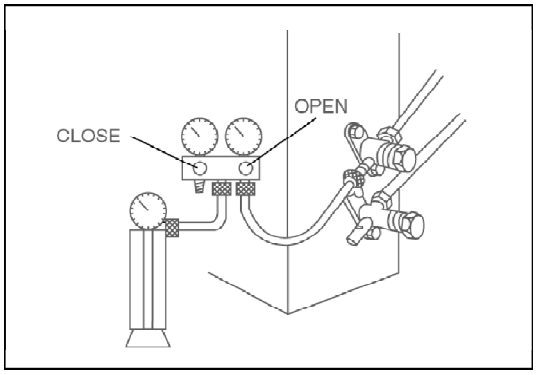
CAUTION

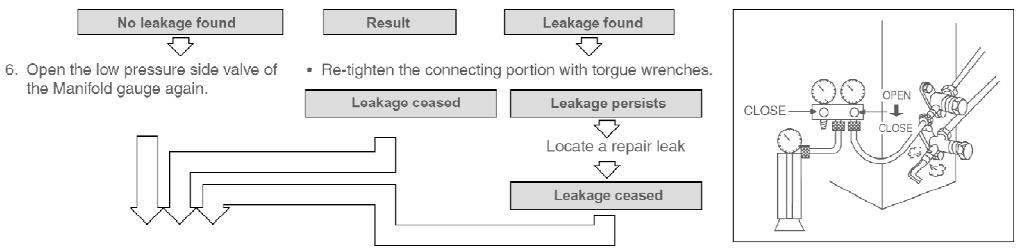
- **If gauge needle does not move from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa), in step 3 above ta following measure:**
- **If the leak stops when the piping connections are tightened further, continue working from ste**
- **If the leak does not stop when the connections are retightened, repair the location of leak.**
- **Do not release refrigerant during piping work for installation and reinstallation. Take care of th liquid refrigerant, it may cause frostbite.**

9.3.5. (b) AIR PURGING OF THE PIPING AND INDOOR UNIT

1) Checking a gas-leakage

1. **Remove the Service port caps from both 3-way valves.**
2. **Connect the Manifold gauge set to the service port of Liquid side 3 -way valve.**
3. **Connect the Charging Cylinder to the Manifold gauge set and open the valve of the Cylinder.**
4. **Open the low pressure side valve of the Manifold gauge for approx. 10 seconds and then close.**
5. **Check a gas-leakage of the connecting portion of pipings.**





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2) Air Purging

The air which contains a moisture is remaining in the Refrigeration cycle may cause a malfunction on the Compressor.

1. **To purge the air, push the pin on the Gas side 3-way valve for three seconds using with a Hexagonal wrench and set it free for one minute.**

   - Repeat this three times.

2. **To balance the refrigerant, close the low pressure side valve on Manifold gauge and release a refrigerant from the piping through service port until the gauge indicates 0.49 ~ 0.294 MPa.**
3. **Set the both 3-way valves to open position with the hexagonal wrench for the unit operation.**

9.3.6. CONNECT THE CABLE TO THE OUTDOOR UNIT

1. **Remove the control board cover from the unit by loosening the screw.**
2. **Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 3 (C12AT) × 1.5 mm^2 or 5 (A12AT) × 1.5 mm^2 or 3 (C18AT/C24AT) × 2.5 mm^2 or 5 (A18AT/ A24AT) × 2.5 mm^2 flexible cord, type designation 245 IEC 57 or heavier cord.**

CS/CU-C12AT, C18AT, C24AT

Terminals on the indoor unit	1	2	⏚
Color of wires			
Terminals on the outdoor unit	1	2	⏚

CS/CU-A12AT, A18AT, A24AT

Terminals on the indoor unit	1	2	3	4	⏚
Color of wires					
Terminals on the outdoor unit	1	2	3	4	⏚

3. **Secure the cable onto the control board with the holder (clamper).**
4. **Attach the control board cover back to the original position with the screw.**

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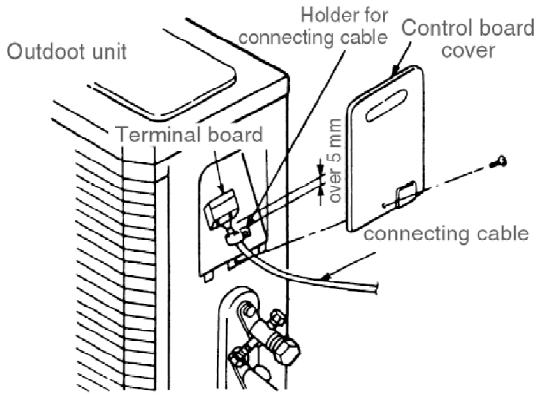

9.3.7. PIPE FORMINGS, INSULATION AND FINISHING

1. **If you may connect and additional drain hose, the end of the drain-outlet should keep distance from the ground.**
   CAUTION
   (Do not dip it into water, and fix it on the wall to avoid swinging in the wind.)

In case of the Outdoor unit is installed below position of the indoor unit.

2. **Tap the Pipings, drain hose and Connecting Cable from down to up.**
3. **From the pipings gathered by taping along the exterior wall and fix it onto the wall by saddle or equivalent.**
   (Refer to the diagram below)

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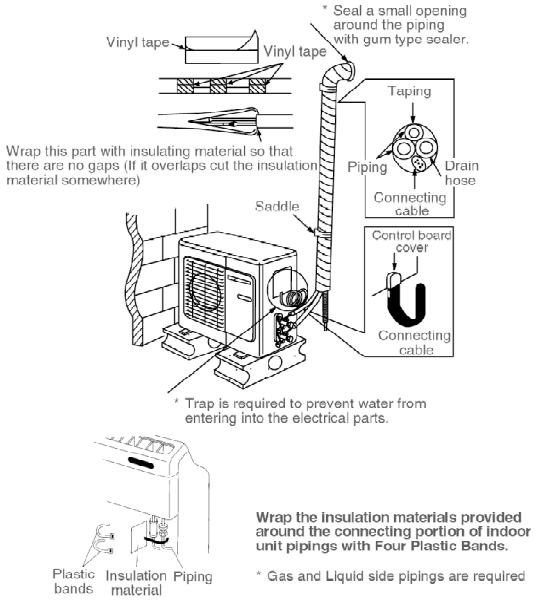
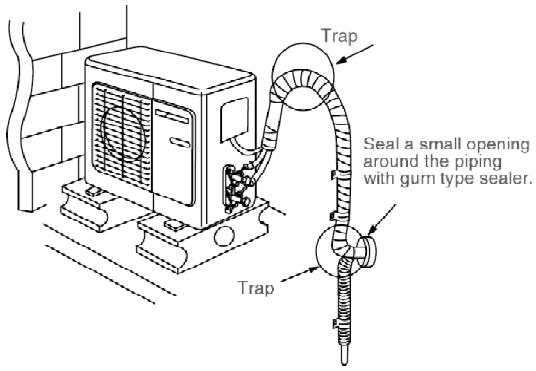

* Seal a small opening around the piping with gum type sealer.
Vinyl tape
Vinyl tape
Taping
Wrap this part with insulating material so that there are no gaps (If it overlaps cut the insulation material somewhere)
Piping
Drain hose
Connecting cable
Saddle
Control board cover
Connecting cable
* Trap is required to prevent water from entering into the electrical parts.

Wrap the insulation materials provided around the connecting portion of indoor unit pipings with Four Plastic Bands.

* Gas and Liquid side pipings are required

In case of the Outdoor unit is installed upper position of the indoor unit.

1. **Tape the Pipings, and Connecting cable from down to up.**
2. **From the pipings gathered by taping along the exterior wall and the trap is required to prevent water from entering the room.**
3. **Fix the pipings onto the wall by saddle or equivalent. (Refer to the diagram below)**



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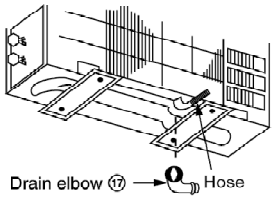
DISPOSAL OF OUTDOOR UNIT DRAIN WATER

- If a drain elbow is used, the unit should be placed on a stand which is taller than 3 cm.
- If the unit is used in an area where temperature falls below 0°C for 2 or 3 days in succession, it is recommended not to use a drain elbow, for the drain water freezes and the fan will not rotate.



Install the hose at an angle so that the water smoothly flows out.

TEST RUNNING

Connect the power supply

1. Connect the power supply cord to independent power supply.
2. Prepare the remote control.

   - Insert two batteries provided.
     Remove the cover from the back of the remote control.
   - Slide the cover according to the arrow direction.
     Insert the two batteries.
     (Two R03 Panasonic dry-cell batteries or equivalent.)
   - Be sure that the (+) and (—) directions are correct.
   - Be sure that both batteries are new.
     Re-attach the cover.
   - Slide it back into position.

3. Operate the unit at cooling operation mode for fifteen minutes or more.

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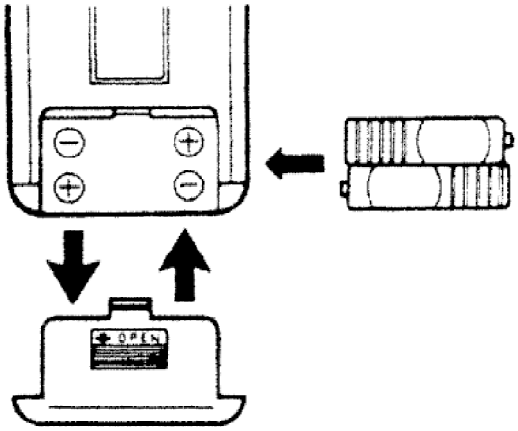
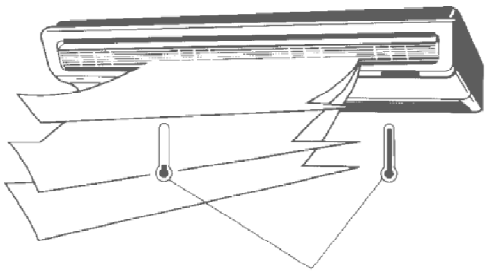


EVALUATION OF THE PERFORMANCE

- Operate the unit at cooling operation mode for fifteen minutes or more.
- Measure the temperature of the intake and discharge air.
- Ensure the difference between the intake temperature and the discharge is more than 8°C.



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NOTE:

These equipment shall be connected to a suitable mains network with a main impedance less than the following:

CS-A12ATP5/CU-A12ATP5: 0.4 Ω
CS-C12ATP5/CU-C12ATP5: 0.4 Ω
CS-A18ATP5/CU-A18ATP5: 0.17 Ω
CS-C18ATP5/CU-C18ATP5: 0.17 Ω
CS-A24ATP5/CU-A24ATP5: 0.16 Ω
CS-C24ATP5/CU-C24ATP5: 0.16 Ω

CHECK ITEMS

☐ **Is there any gas leakage at flare nut connections?**

☐ **Has the heat insulation been carried out at flare nut connection?**

☐ **Is the connecting cable being fixed to terminal board firmly?**

☐ **Is the connecting cable being clamped firmly?**

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Is the drainage OK?

☐ **(Refer to “Check the drainage” section)**

Is the earth wire connection properly done?

☐

Is the indoor unit properly hooked to the installation plate?

☐

Is the power supply voltage complied with rated value?

☐

Is there any abnormal sound?

☐

Is the cooling operation normal?

☐

Is the thermostat operation normal?

☐

Is the remote control’s LCD operation normal?

☐

Is the air purifying filter installed?

☐

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10. Servicing Information

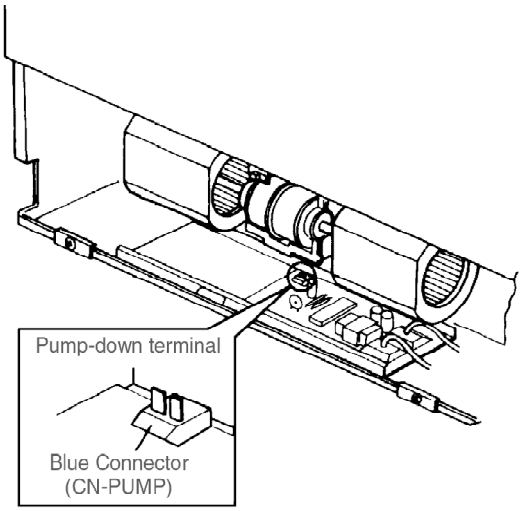
Pump-Down Terminal

- The thermostat will be switched ON (even if the room temperature is low) when the pump-down terminal is short-circuited (by using) alligator-type clips or a similar method), thus permitting easy pump -down when the unit is to be moved to another place.

For charging the Wireless Remote Control Transmitter's Oscillation Code

- If two or more air conditioners are located in the same room, any one of four oscillation codes can be selected by simply adding parts to the Remote Control Printed Circuit Board and the indoor unit Main Control P.C.B.
(If the two or more air conditioners in one room have the same oscillation code, all of them will be activated by operation of one Remote Control transmitter.)

- By adding a jumper wire at the Remote Control P.C.B. and main P.C.B. as shown in the table at the right, any one of four oscillation codes, including the one at the time of shipment from the plant (No. 0), can be selected.



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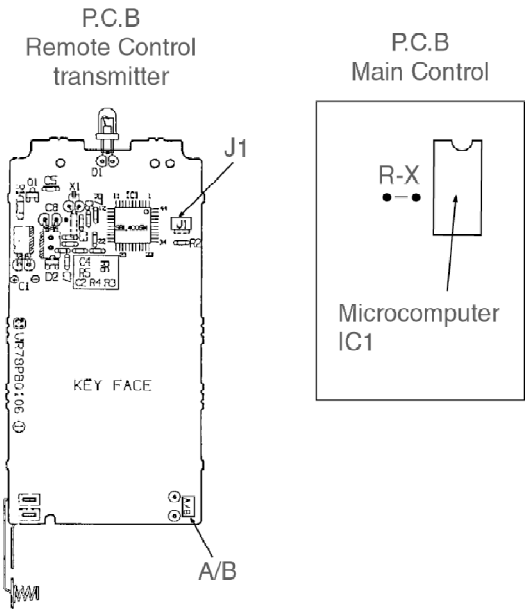

	P.C.B. Remote Control		P.C.B. Main Control	Remarks
	A/B	J1	RX	
No. 0	ON	OFF	—	As shipped from factory
No. 1	OFF	OFF	16k Ω	
No. 2	ON	ON	6.2k Ω	
No. 3	OFF	ON	Jumper	

11. Troubleshooting Guide

11.1. Refrigeration cycle system

In order to diagnose malfunctions, make sure that there are no electrical problems before inspecting the refrigeration cycle. Such problems include insufficient insulation, problem with the power source, malfunction of a compressor and a fan.
The normal outlet air temperature and pressure of the refrigeration cycle depends on various conditions, the standard values for them are shown in the table on the right.

Normal Pressure and Outlet Air Temperature (Standard)

	Gas pressure MPa (kg/cm^2G)	Outlet air temperature (°C)
Cooling mode	0.4 ~ 0.6 (4 ~ 6)	12 ~ 16
Heating Mode	1.5 ~ 2.1 (15 ~ 21)	36 ~ 45

★ Condition: Indoor fan speed; High
Outdoor temperature is 35°C at cooling mode and 7°C at heating mode

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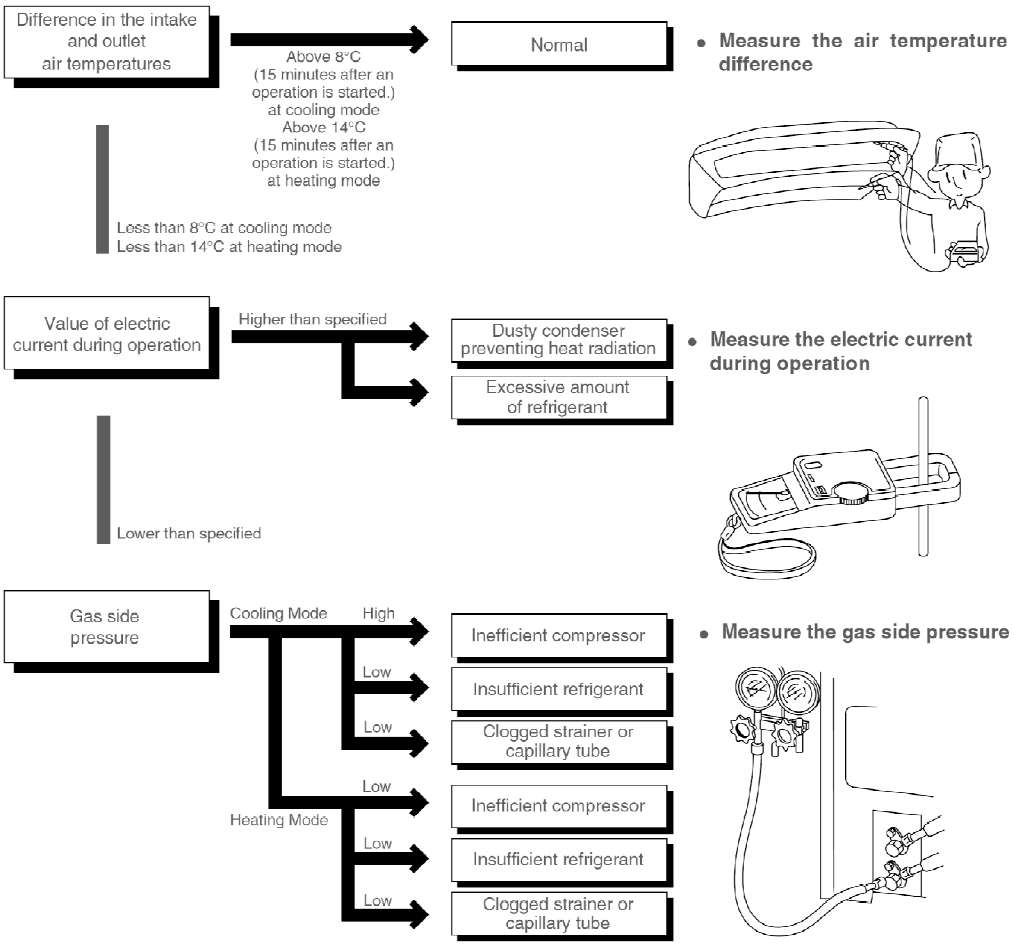
Difference in the intake and outlet air temperatures
Above 8°C (15 minutes after an operation is started.) at cooling mode
Above 14°C (15 minutes after an operation is started.) at heating mode
Less than 8°C at cooling mode
Less than 14°C at heating mode
Normal
• Measure the air temperature difference
Value of electric current during operation
Higher than specified
Lower than specified
Dusty condenser preventing heat radiation
Excessive amount of refrigerant
• Measure the electric current during operation
Gas side pressure
Cooling Mode
Heating Mode
High
Low
Low
Low
Low
Low
Inefficient compressor
Insufficient refrigerant
Clogged strainer or capillary tube
Inefficient compressor
Insufficient refrigerant
Clogged strainer or capillary tube
• Measure the gas side pressure

11.1.1. Relationship between the condition of the air conditioner and pressure and electric current

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Condition of the air conditoner	Cooling Mode			Heating Mode		
	Low Pressure	High Pressure	Electric current during operation	Low Pressure	High Pressure	El cu du ope
Insufficient refrigerant (gas leakage)	↘	↘	↘	↘	↘	↘
Clogged capillary tube or Strainer	↘	↘	↘	↘	↘	↘
Short circuit in the indoor unit	↘	↘	↘	↗	↗	↗
Heat radiation deficiency of the outdoor unit	↗	↗	↗	↘	↘	↘
Inefficient compression	↗	↘	↘	↗	↘	↘

- Carry out the measurements of pressure, electric current, and temperature fifteen minutes after an operation is started.

11.1.2. Diagnosis methods of a malfunction of a compressor and 4-way valve

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Nature of fault	Symptom
Insufficient compressing of a compressor	-Electric current during operation becomes approximately 20% lower than the normal valu -The discharge tube of the compressor becomes abnormally hot (normally 70 to 90°C). -The difference between high pressure and low pressure becomes almost zero.
Locked compressor	-Electric current reaches a high level abnormally, and the value exceeds the limit of an am some cases, a breaker turns off. -The compressor is a humming sound.
Insufficient switches of the 4-way valve	-Electric current during operation becomes approximately 80% lower than the normal valu -The temperature different between from the discharge tube to the 4-way valve and from s to the 4-way valve becomes almost zero.

12. Technical Data

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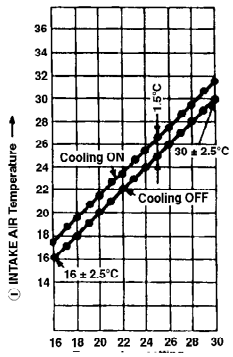
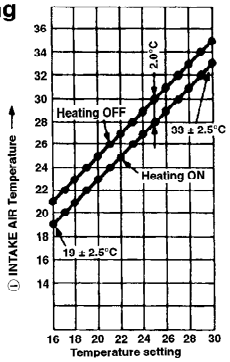
■ Thermostat characteristics

• **Cooling**



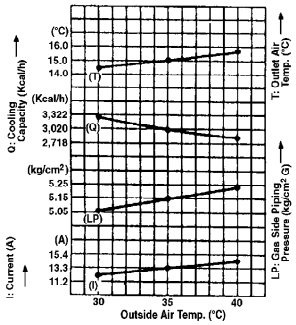
• **Heating**



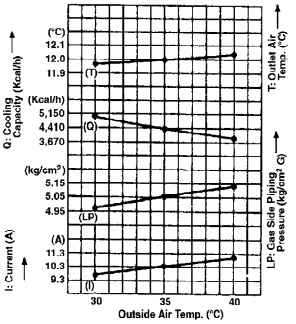
■ Operation characteristics

Cooling characteristics – Outdoor temperature
(Conditions: Room Temperature; 27°C (D.B.T)
Cooling operation; at High Fan)

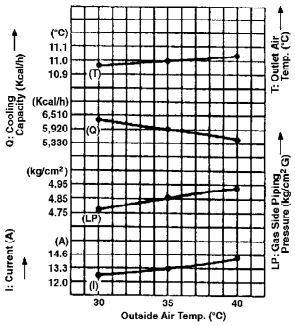
• **CS-A12ATP**



• **CS-A18ATP**

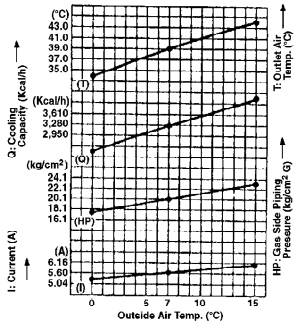


• **CS-A24ATP**

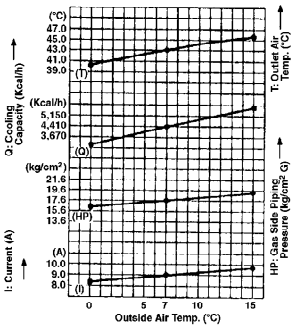


Heating characteristics – Outdoor temperature
(Conditions: Room Temperature; 27°C (D.B.T)
Heating operation; at High Fan)

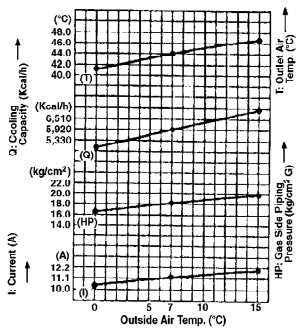
• **CS-A12ATP**



• **CS-A18ATP**



• **CS-A24ATP**



■ Sensible Capacity Chart

• **CS-A12ATP5**

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240V	Outdoor Temp. (°C)											
Indoor wet bulb temp.	30			35			40			46		
	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
17.0°C	3.37	2.56	1.19	3.15	2.45	1.28	2.93	2.36	1.37	2.67	2.24	1.48
19.0°C				3.40		1.30						
19.5°C	3.70	2.68	1.21	3.46	2.57	1.31	3.22	2.48	1.40	2.93	2.36	1.51
22.0°C	4.04	2.78	1.24	3.77	2.67	1.33	3.51	2.58	1.42	3.19	2.46	1.53

230V	Outdoor Temp. (°C)											
Indoor wet bulb temp.	30			35			40			46		
	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
17.0°C	3.32	2.52	1.17	3.11	2.42	1.26	2.89	2.32	1.35	2.63	2.21	1.46
19.0°C				3.35		1.28						
19.5°C	3.65	2.64	1.19	3.41	2.53	1.29	3.17	2.44	1.37	2.88	2.32	1.48
22.0°C	3.98	2.74	1.22	3.72	2.63	1.31	3.46	2.54	1.40	3.14	2.42	1.51

220V	Outdoor Temp. (°C)											
Indoor wet bulb temp.	30			35			40			46		
	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
17.0°C	3.32	2.52	1.16	3.11	2.42	1.25	2.89	2.32	1.34	2.63	2.21	1.44
19.0°C				3.35		1.27						
19.5°C	3.65	2.64	1.18	3.41	2.53	1.28	3.17	2.44	1.36	2.88	2.32	1.47
22.0°C	3.98	2.74	1.21	3.72	2.63	1.30	3.46	2.54	1.39	3.14	2.42	1.50

- **CS-A18ATP5**

240V	Outdoor Temp. (°C)											
Indoor wet bulb temp.	30			35			40			46		
	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
17.0°C	3.37	2.56	1.19	3.15	2.45	1.28	2.93	2.36	1.37	2.67	2.24	1.48
19.0°C				3.40		1.30						
19.5°C	3.70	2.68	1.21	3.46	2.57	1.31	3.22	2.48	1.40	2.93	2.36	1.51
22.0°C	4.04	2.78	1.24	3.77	2.67	1.33	3.51	2.58	1.42	3.19	2.46	1.53

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230V	Outdoor Temp. (°C)											
Indoor wet bulb temp.	30			35			40			46		
	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
17.0°C	5.01	3.80	1.95	4.68	3.64	2.10	4.35	3.50	2.25	3.96	3.33	2.42
19.0°C				5.05		2.13						
19.5°C	5.50	3.98	1.99	5.14	3.82	2.14	4.78	3.68	2.29	4.35	3.50	2.47
22.0°C	5.99	4.12	2.02	5.60	3.97	2.18	5.21	3.83	2.33	4.74	3.65	2.51

220V	Outdoor Temp. (°C)											
Indoor wet bulb temp.	30			35			40			46		
	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
17.0°C	5.01	3.80	1.91	4.68	3.64	2.05	4.35	3.50	2.19	3.96	3.33	2.36
19.0°C				5.05		2.08						
19.5°C	5.50	3.98	1.94	5.14	3.82	2.09	4.78	3.68	2.23	4.35	3.50	2.41
22.0°C	5.99	4.12	1.98	5.60	3.97	2.13	5.21	3.83	2.27	4.74	3.65	2.45

- **CS-A24ATP5**

240V	Outdoor Temp. (°C)											
Indoor wet bulb temp.	30			35			40			46		
	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
17.0°C	3.37	2.56	1.19	3.15	2.45	1.28	2.93	2.36	1.37	2.67	2.24	1.48
19.0°C				3.40		1.30						
19.5°C	3.70	2.68	1.21	3.46	2.57	1.31	3.22	2.48	1.40	2.93	2.36	1.51
22.0°C	4.04	2.78	1.24	3.77	2.67	1.33	3.51	2.58	1.42	3.19	2.46	1.53

230V	Outdoor Temp. (°C)											
Indoor wet bulb temp.	30			35			40			46		
	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
17.0°C	6.00	4.55	2.56	5.61	4.36	2.76	5.22	4.19	2.95	4.74	3.98	3.18
19.0°C				6.05		2.80						
19.5°C	6.59	4.76	2.61	6.16	4.58	2.81	5.73	4.41	3.01	5.21	4.19	3.24
22.0°C	7.18	4.94	2.66	6.71	4.75	2.86	6.24	4.58	3.06	5.67	4.37	3.30

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220V	Outdoor Temp. (°C)											
Indoor wet bulb temp.	30			35			40			46		
	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
17.0°C	5.95	4.51	2.52	5.56	4.33	2.71	5.17	4.16	2.90	4.70	3.95	3.13
19.0°C				6.00		2.75						
19.5°C	6.53	4.72	2.57	6.11	4.54	2.76	5.68	4.37	2.95	5.17	4.16	3.18
22.0°C	7.12	4.90	2.61	6.65	4.71	2.81	6.19	4.54	3.01	5.63	4.33	3.24

TC - Total Cooling Capacity (kW)
SHC - Sensible Heat Capacity (kW)
IP - Input Power (kW)

Indoor 27°C/19°C
Outdoor 35°C/24°C

13. Exploded View

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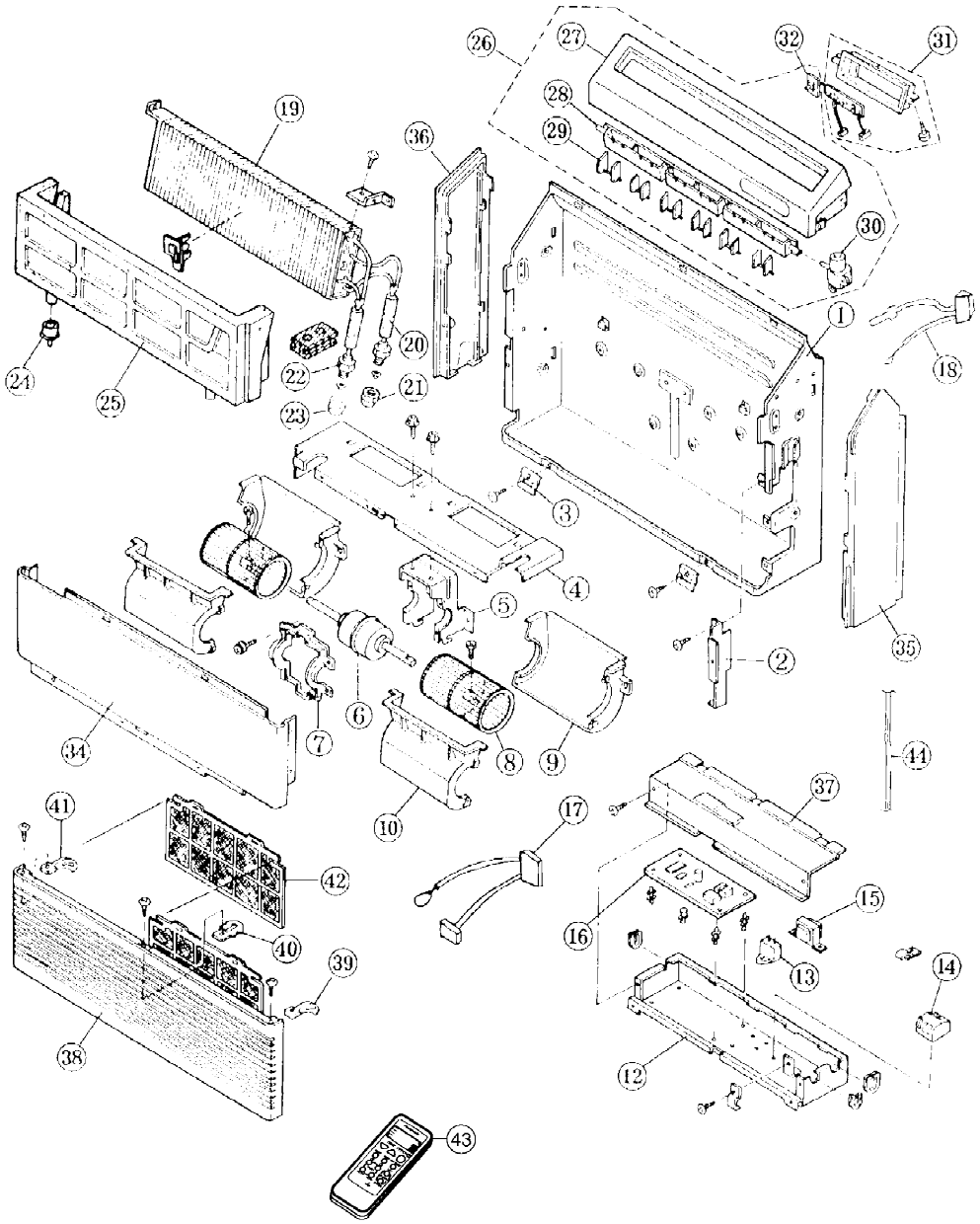
CS-A12ATP / CS-A18ATP / CS-A24ATP



14. Replacement Parts List

<Model: CS-A12ATP / CS-A18ATP / CS-A24ATP>

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REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-A12ATP5	CS-A18ATP5	CS-C24ATP5
1	BASE ASS'Y	1	CWD52K195B	←	←
2	PARTICULAR PLATE FOR BASE	1	CWD90811	←	←
3	PARTICULAR PIECE	2	CWD93592	←	←
4	PARTICULAR PLATE	1	CWD90821	←	←
5	FAN MOTOR BRACKET (BOTTOM)	1	CWD54152	←	←
6	FAN MOTOR	1	CWA921094	CWA921092	←
7	FAN MOTOR BRACKET (UPPER)	1	CWD54153	←	←
8	BLOWER WHEEL ASS'Y	2	CWH01K094	←	←
9	AIR GUIDER B.W. (BOTTOM)	2	CWD32104	←	←
10	AIR GUIDER B.W. (UPPER)	2	CWD32103	←	←
12	CONTROL BOARD ASS'Y	1	CWH10K330	←	←
13	CAPACITOR FOR FAN MOTOR	1	CWA31342 (1.2MF/400VAC)	CWA31615 (1.2MF/450VAC)	←
14	TERMINAL BOARD (BIG)	1	CWA28K1030	←	←
15	TRANSFORMER	1	CWA40C192	←	←
16	P.C. BOARD-MAIN	1	CWA742727	←	←
17	SENSOR ASS'Y (INTAKE AIR)	1	CWA50C447	←	←
18	SENSOR - EVAPORATOR PIPE	1	CWA50C534	CWA50C533	←
19	EVAPORATOR	1	CWB30428	CWB30429	CWB30430
20	TUBE ASS'Y (LIQUID SIDE)	1	CWT01494	CWT01479	←
21	FLARE NUT	1	CWH6002140 (1/4")	←	←
22	TUBE ASS'Y (GAS SIDE)	1	CWT01495	CWT01480	CWT01481
23	FLARE NUT	1	CWT25007 (1/2")	←	CWT25004 (5/8")
24	TAP DRAIN TRAY	1	CWH4612103	←	←
25	DRAIN PAN ASS'Y	1	CWH40K025	←	←
26	DISCHARGE GRILLE COMPLETE	1	CWE20C2127	←	←
27	DISCHARGE GRILLE	1	CWE20C135	←	←

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REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-A12ATP5	CS-A18ATP5	CS-C24ATP5
28	VANE - AIR SWING	1	CWE24233A	←	←
29	VANE	12	CWE24234A	←	←
30	AIR SWING MOTOR	1	CWA98K059	←	←
31	INDICATOR	1	CWE391051	←	←
32	RECEIVER COMPLETE	1	CWD76C003	←	←
34	CABINET FRONT PLATE	1	CWE06074A	←	←
35	CABINET RIGHT SIDE PLATE	1	CWE04109	←	←
36	CABINET LEFT SIDE PLATE	1	CWE04110	←	←
37	CONTROL BOARD COVER	1	CWH13292	-	-
38	INTAKE GRILLE	1	CWE22C052	←	←
39	HOLDER - INTAKE GRILLE (RIGHT)	1	CWD93594	←	←
40	HOLDER - INTAKE GRILLE (UPPER)	1	CWD93593	←	←
41	HOLDER - INTAKE GRILLE (LEFT)	1	CWD93607	←	←
42	AIR FILTER	2	CWD00112	←	←
43	REMOTE CONTROL COMPLETE	1	CWA75C2208	←	←
44	POWER SUPPLY CORD	1	CWA20C2223	CWA20C2221	CWA20C2222

(Note)

- All parts are supplied from MACC, Malaysia (Vendor Code: 061).

15. Exploded View

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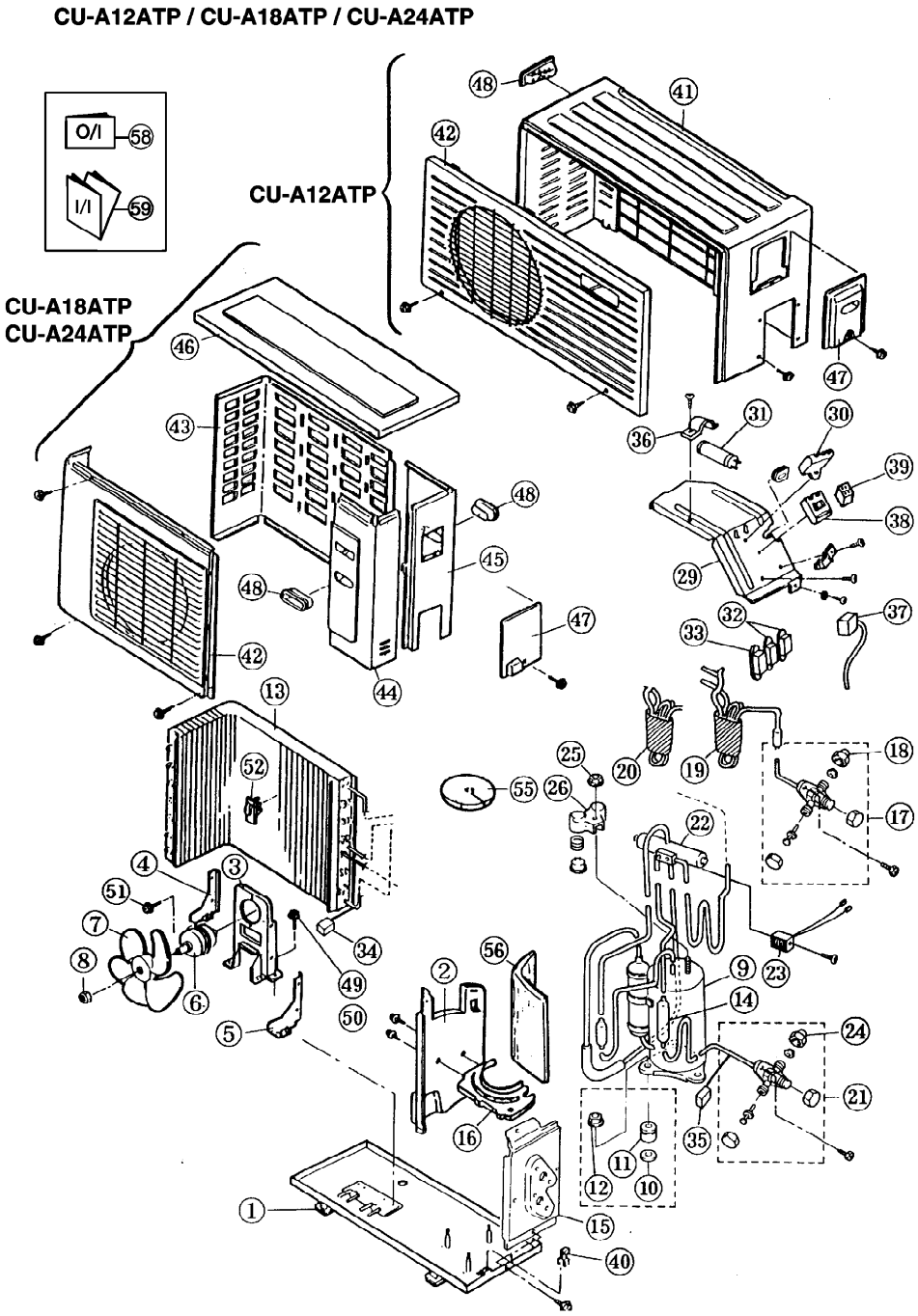

16. Replacement Parts List

<Model: CU-A12ATP / CU-A18ATPT / CU-A24ATPT>

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REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-A12ATP5	CU-A28ATPT5	CU-A24ATPT5
1	CHASSY ASS'Y	1	CWD50K550A	CWD50K514B	←
2	SOUND PROOF BOARD	1	CWH15214	CWH15223	←
3	FAN MOTOR BRACKET	1	CWD54155	CWD54145	←
4	SUPPORTOR - F.M. BRACKET (LEFT)	1	-	CWD90835	←
5	SUPPORTOR - F.M. BRACKET (RIGHT)	1	-	CWD90836	←
6	FAN MOTOR	1	CWA951151	CWA921095	CWA921093
7	PROPELLER FAN	1	CWH03K002	CWH00K049	←
8	NUT - P. FAN	1	CWH56053	CWH56060	←
9	COMPRESSOR	1	2KS224D5AA02	2JS350D3DA02	2JS442D3BA01
10	PACKING - COMP. MOUNT.	1/2	CWB81047	CWB81043 (2)	←
11	BUSHING - COMP. MOUNT.	3	CWH50055	←	←
12	NUT - COMP. MOUNT.	3	CWH4582065	←	←
13	CONDENSER	1	CWBDCC004	CWB32C177	←
14	RECEIVER	1	CWB14010	CWB14011	←
15	HOLDER - COUPLING	1	CWH35123A	CWH35113B	CWH35114B
16	GUIDER - COMP.	1	-	CWD90830	←
17	3-WAY VALVE (LIQUID SIDE)	1	CWB01380	CWB01463	←
18	FLARE NUT	1	CWH6002140 (1/4")	←	←
19	TUBE ASS'Y (STRAINER, CAPILLARY)	1	CWB11025	CWT01531	←
20	TUBE ASS'Y (CHECK VALVE, CAPILLARY)	1	CWT00C721	-	-
21	3-WAY VALVE (GAS SIDE)	1	CWB01379	CWB01364	CWB01377
22	4-WAY VALVE	1	CWB00003	←	←
23	4-WAY COIL COMPLETE	1	CWA43C2085	CWA43C2084	←
24	FLARE NUT	1	CWT25007 (1/2")	←	CWT25004 (5/8")
25	NUT - TERMINAL COVER	1	CWH7080300	←	←
26	TERMINAL COVER - COMP.	1	CWH171011	CWH171012	←

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REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-A12ATP5	CU-A28ATPT5	CU-A24ATPT5
29	CONTROL BOARD	1	CWH102127	CWH10K331	←
30	CAPACITOR - F. MOTOR	1	CWA31602 (1.2MF, 400V)	DS371356CPNA (3.5MF, 400VAC)	←
31	CAPACITOR - COMP.	1	CWA312076 (30MF, 370V)	CWA312077 (35MF, 370VAC)	CWA312079 (45MF, 370VAC)
32	ELECTRO MAGNETIC SWITCH	2	CWA00059	←	←
33	ELECTRO MAGNETIC SWITCH	1	-	CWA00111	←
34	PRESSURE SWITCH	2	CWA10046	←	←
35	PRESSURE SWITCH	2	CWA10047	←	←
36	HOLDER - CAPACITOR	1	CWA30057	←	CWH30060
37	THERMOSTAT	1	-	CWA15129	←
38	TERMINAL BOARD	1	CWA28K1021	←	←
39	TERMINAL BOARD (SMALL)	1	-	CWH4711012	←
40	HOLDER - SENSOR	1	-	CWH32002	←
41	CABINET ASS'Y	1	CWE00K240B	-	-
42	CABINET FRONT PLATE	1	CWE06C050B	CWE06K024B	←
43	CABINET REAR PLATE	1	-	CWE02096B	←
44	CABINET FRONT PLATE	1	-	CWE06075B	←
45	CABINET SIDE PLATE	1	-	CWE04111B	←
46	CABINET TOP PLATE	1	-	CWE03101B	←
47	CONTROL BOARD COVER	1	CWH13C286	CWH13021D	←
48	HANDLE	1/2	CWE16037C (1)	CWE16000E (2)	←
49	SCREW - FAN MOTOR BRACKET	4/6	CWH4580399 (4)	CWH55101 (6)	←
50	SCREW - SUPPORTOR	10	-	CWH4580345	←
51	SCREW - FAN MOTOR MOUNT	2/4	CWH55027 (2)	CWH55252 (4)	←
52	HOLDER - F.M. LEAD WIRES	1	CWH31043	CWH31043	←
55	SOUND PROOF MATERIAL (COMP.)	1	-	CWG30561	←

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REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-A12ATP5	CU-A28ATPT5	CU-A24ATPT5
56	SOUND PROOF MATERIAL	1	CWG30596	-	-
58	OPERATING INSTRUCTIONS	1	CWF563417	←	←
59	INSTALLATION INSTRUCTIONS	1	CWF612226 CWF612227 CWF612228	←	←

(Note)

- All parts are supplied from MACC, Malaysia (Vendor Code: 061).

17. Electronic Parts List

CWA74314

SYMBOL	DESCRIPTION & NAME	PART NO.
BZ	BUZZER	A48039
D1, D2, D3, D4, D5	DIODE	A54MA165TA5
D6	DIODE	A54RA15-01KB
DB1	DIODE BRIDGE	A54CS1VB20E
FUSE	FUSE	XBA2C20TR0
IC1	INTEGRATED CIRCUIT	A52D7533U313
IC2	INTEGRATED CIRCUIT	A54MN1551ABA
IC3	INTEGRATED CIRCUIT	A52MPC393C
IC4	INTEGRATED CIRCUIT	A52MPA2003C
IC5	INTEGRATED CIRCUIT	A52M54566P
IC6	INTEGRATED CIRCUIT	A52C057
IC7	INTEGRATED CIRCUIT	A52LQT50.5X1
IC8	INTEGRATED CIRCUIT	A52C057
PC1	PHOTO COUPLER	A52LP620-GB
Q1	TRANSISTOR	A55DTD1234EST
Q2, Q3	TRANSISTOR	A55C1740STPQ
Q4	TRANSISTOR	A55DTC123YST
RY-C	RELAY	A00042
RY-H, RY-M, RY-L, RY-HOT	RELAY	A00084
X1	RESONATOR	A45CSB400P19
X2	RESONATOR	A45ST4.0MGWT
ZD1	ZENAR DIODE	A54D6.2EL2TB
ZNR1	ZNR	A54C057

(Note)

- All parts are supplied from MACC, Malaysia (Vendor Code: 086)

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18. Electronic Circuit Diagram

How to use electronic circuit diagram

Before using the circuit diagram, read the following carefully.

* Voltage measurement
  Voltage has been measured with a digital tester when the indoor fan is set at high fan speed under the following conditions without setting the timer.
  Use them for servicing.
  Voltage indication is in Red at all operations.

	Intake air temperature	Temperature setting	Discharge air temperature	Pipe temperature
Cooling	27°C	20°C	17°C	15°C

* Indications for resistance
  a. K....kΩ M....MΩ
  W...watt Not indicated....1/4W
  b. Type
  Not indicated.....carbon resister
  Tolerance±5%
  .....metal oxide resister
  Tolerance±1%

* Indications for capacitor
  a. Unit μ....μF P....pF
  b. Type Not indicated....ceramic capacitor
  (S).....S series aluminium electrolytic capacitor
  (Z).....Z series aluminium electrolytic capacitor
  (SU).....SU series aluminium electrolytic capacitor
  (P).....P series polyester system
  (SXE).....SXE series aluminium electrolytic capacitor
  (SRA).....SRA series aluminium electrolytic capacitor
  (KME).....KME series aluminium electrolytic capacitor

* Diode without indication.....MA165
※ Circuit Diagram is subject to change without notice for further development.

TIMER TABLE

Name	Time	Test Mode (When test point Short-circuited)	Remarks
Time Delay Safety Control	**2 min. 58 sec.**	**0 sec.**	
Circuit Protection Control	**30 sec.**	**0 sec.**	
Starting Current Control	**1.6 sec.**	**0 sec.**	
Automatic Restarting Control	**7 min.**	**7 min.**	**Sleep Mode**
	5 min.	**5 min.**	
Timer	**12 hrs.**	**12 min.**	
	11 hrs.	**11 min.**	
	10 hrs.	**10 min.**	
	9 hrs.	**9 min.**	
	8 hrs.	**8 min.**	
	7 hrs.	**7 min.**	
	6 hrs.	**6 min.**	

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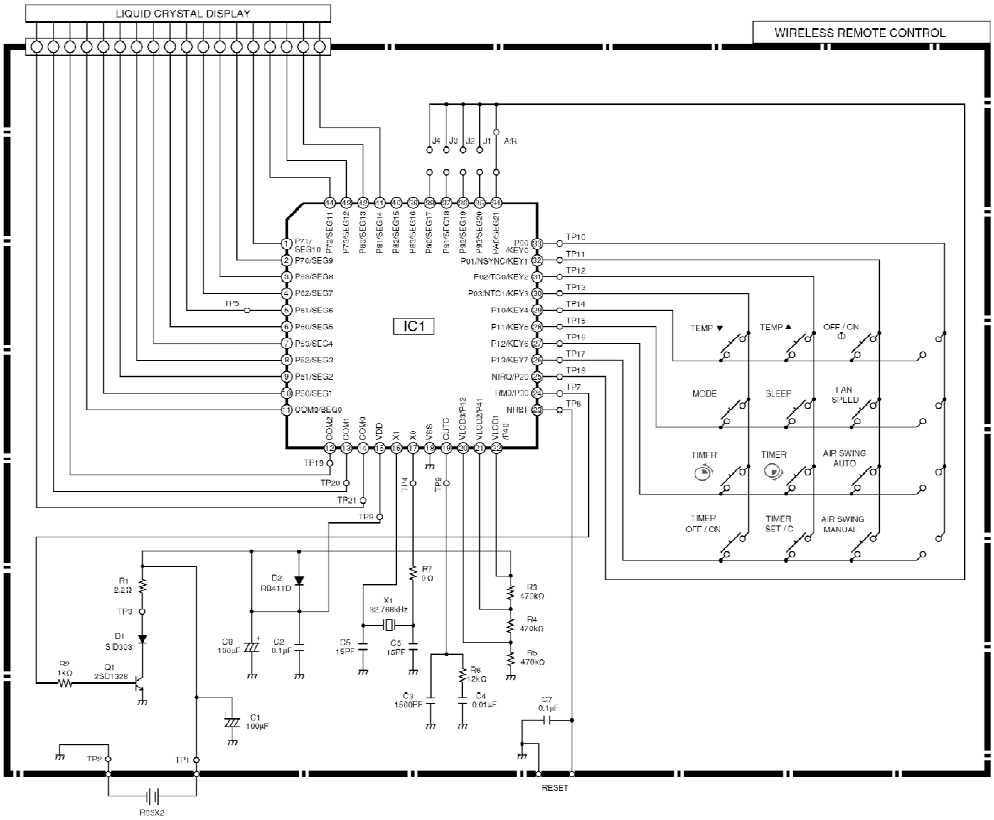
	5 hrs.	5 min.	
	4 hrs.	4 min.	
	3 hrs.	4 min.	
	2 hrs.	2 min.	
	1 hr.	1 min.	
Sleep Mode Auto Control	10 min.	10 sec.	ON Time
	20 min.	20 sec.	OFF Time
	5 hrs.	5 min.	
Soft Dry	4 sec.	4 sec.	ON/OFF
	10 min.	1 min.	ON
	6 min.	6 min.	OFF
Anti Freezing Control	3 min.	18 sec.	

18.1. REMOTE CONTROL /



Remote Control No.	Main P.C.B.
	RX
0	——
1	16kΩ
2	6.2kΩ
3	Jumper

Remote Control No.	A/B	J1	Remarks
0	ON	OFF	at Delivery
1	OFF	OFF	
2	ON	ON	
3	OFF	ON	

18.2. PRINT PATTERN / INDOOR UNIT PRINTED CIRCUIT BOARD / /

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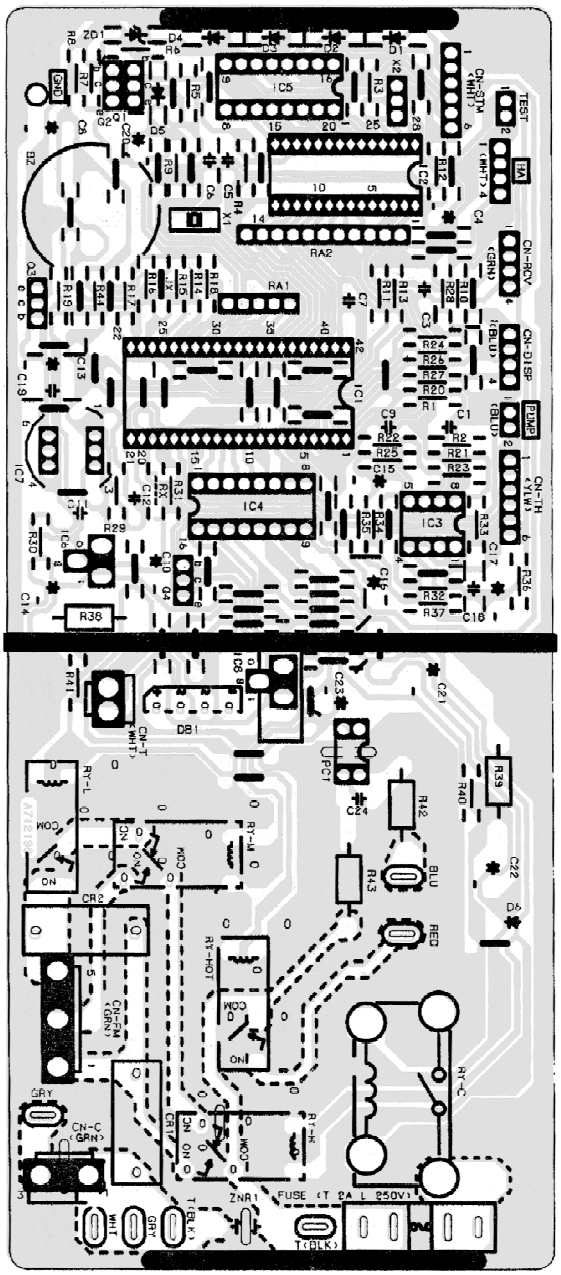
TOP VIEW



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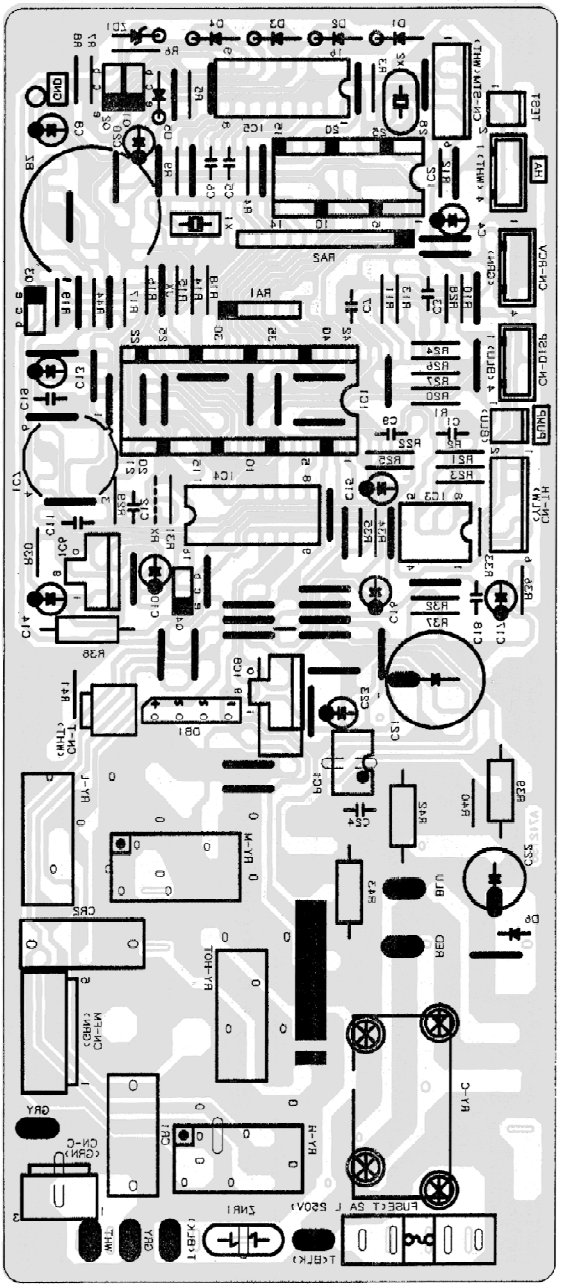
BOTTOM VIEW



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